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01 | 04

SAN Configuration Guide

HP Storage

QLogic SAN Configuration Guide for HP Storage

Version 2.0

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Table of Contents

Introduction **9**

Statement of Support **11**

Test Philosophy **13**

Application-Level Interoperability Test **13**

Device-Level Interoperability **13**

Server Interoperability 13

Storage Interoperability 13

Application Device-Level Interoperability 13

Tested SAN Configurations **14**

Single-Switch Configuration: SANbox2-64 14

Cascade Configuration: SANbox 5200 15

Cascade Configuration: SANbox2-16 and SANbox2-64 15

Cascade Configuration: SANbox2-64 and McDATA 4500 16

Cascade Configuration: SANbox2-64 and Brocade 3800 16

Driver and Firmware Levels **17**

QLogic SANblade HBAs **17**

Switches **17**

HP Storage **17**

Application Software **18**

Operating Systems **18**

Libraries and Tape Drives 18

Server Configuration **20**

Fibre Channel HBAs Overview 20

Assumptions 20

Installing HBA Drivers 20

Windows 2000 HBA Driver 21

Windows 2000 HBA Pseudo LUN Driver 23

SANsurfer Management Suite 25

Installing SANsurfer Management Suite on Windows 25

Configuring the HBA 28
Configuring the HBA on Windows 2000 Server 28
Storage Network Configuration 35
Fibre Channel Switches from QLogic 35
SANbox 5000 Series Stackable Switches 35
SANbox2 Switches 35
Configuration Overview 35
SANbox 5000 Series Configuration 36
Configuring the Switch 36
Installing SANbox Manager 37
Selecting Configuration Options 42
Configuring Port Properties 56
Connecting Cables 60
Configuring Zones 61
SANbox2 Configuration 69
Configuring the Switch 69
Configuring Serial Ports 69
Assigning IP Address 69
Configuring Port Properties 70
Setting up HBA Persistent Binding 74
Connecting Cables 75
Configuring Zones 76

Storage Configuration 83

HP StorageWorks MSA1000 Overview 83
MSA1000 Configuration 84
Assumptions 84
Configuration Steps 84
Setting up the Serial Connection 84
Creating a RAID and LUN 85
Identifying the Unit 88
Adding and Identifying Connections 90
Adding the Access Control List 93
Verifying Device Detection 94

Testing Your SAN **95**
Zone Verification 95
Test Configuration 95

Application Software Configuration **97**

VERITAS NetBackup **97**

Index **99**

QLogic Press Review **103**

QLogic Company Information **105**

Introduction

The *QLogic SAN Configuration Guide for HP Storage* is a comprehensive resource for developers and consultants interested in deploying QLogic solutions.

How to Use This Guide

This guide provides detailed solution configurations and interoperability information, which allow you to deploy a QLogic-powered SAN. Updated versions of this guide can be downloaded from the QLogic website at: http://www.qlogic.com/interopguide.

End-to-end interoperability not only includes switches, host bus adapters (HBAs), and storage products; it also extends to the component level. Therefore, this guide includes detailed information outlining the exact configurations tested by QLogic and the procedures necessary to deploy a SAN.

For More Information

Over 50 million QLogic products have shipped inside servers, workstations, RAID subsystems, tape libraries, disk and tape drives. Powering solutions from the industry's leading storage network providers, the broad line of QLogic controller chips, HBAs, storage network switches and management software move data from storage devices through the network fabric to servers.

Additional QLogic resources can be found at the following locations:

Fibre Channel Host Bus Adapters

http://www.qlogic.com/products/fc_san_hostadapers.asp

Fibre Channel Switches

http://www.qlogic.com/products/fc_san_switchs.asp

QLogic Technical Support

http://www.qlogic.com/support/

Interoperability Guides from QLogic Press

http://www.qlogic.com/interopguide/

Statement of Support

QLogic understands the unique needs and complexities of each and every SAN. As a result, the QLogic SANtrack™ Service and Support Program provides customers with a flexible way to create a unique service and support package designed specifically to meet your distinct business requirements.

QLogic switch products allow a wide range of organizations to exploit the power of a SAN. Whether it's a fast growing small firm implementing a network with 10-20 devices or a Fortune 100 Corporation creating a large infrastructure with thousands of devices, QLogic SANtrack Service and Support Program effectively addresses either set of business requirements.

The SANtrack Service and Support Program is a diverse offering of a range of services including: Select and Prime service plans, Pre-Install Analysis, Installation, On-Site and Spare Upgrades. Customers may choose among the services that best meet the demands of their business. Most importantly, customers are assured complete satisfaction since QLogic and its qualified partners fully guarantee all products and services.

NOTE: For additional information on support, please see the QLogic website at: http://www.qlogic.com/support/warranty_santrack.asp.

Test Philosophy

The QLogic SAN configuration test philosophy is broken down into two test levels:

- Application-level interoperability
- Device-level interoperability

Application-Level Interoperability Test

The application-level interoperability test ensures that applications such as backup/restore, LAN-free back-up, serverless backup, and server clustering will run as designed on a combinations of hardware components that are representative of customer configurations. At this level, the hardware configurations are, for the most part, complex and can involve numerous devices that differ by type, vendor and operating system. Since the objective of this test is to determine the feasibility of typical customer SAN solutions, not every function of the application can be tested. While the application-level interoperability test addresses the major functions of the application, successful completion of the test does not guarantee full interoperability. However, it does provide a reasonably high level of confidence that the application will function well in most SAN solution scenarios.

Device-Level Interoperability

The device-level and system integration test verifies functionality of the device with additional hardware and software. The interoperability and system integration test ensures conformance with the ANSI Fibre Channel (FC) standards and interoperability between servers and storage.

Server Interoperability

This ensures there are no problems between the HBA and the server. Potential problems, which may be found in this testing, include incompatibility between the HBA and server PCI chipsets, and conflicts between the HBA driver/BIOS setting and drivers/BIOS setting of other installed devices/adapters in the server.

Storage Interoperability

Storage devices such as disk arrays and tape devices are tested with SAN hardware and HBAs. This ensures compatibility between the end device and SAN hardware. Potential problems that may be found include improper LIP handling, AL_PA and Worldwide Name problems, jitter, and so on.

Application Device-Level Interoperability

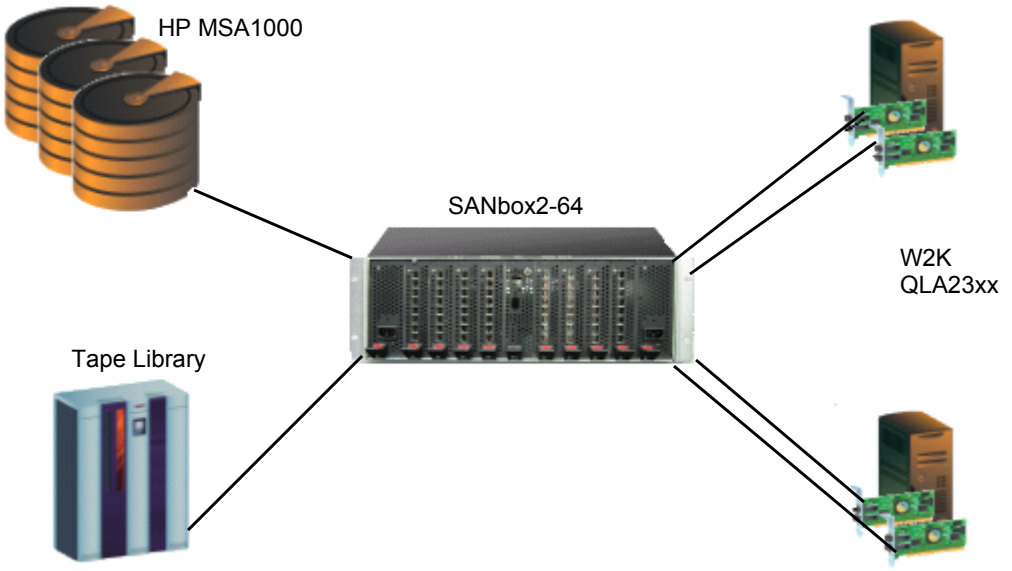
The application device-level interoperability test ensures coexistence with the operating system environment and typical user shrink-wrapped software. It also ensures that the software works with the applicable hardware. In the case of a Windows environment, the component should have successfully completed all applicable Microsoft Hardware Certification program tests.

Tested SAN Configurations

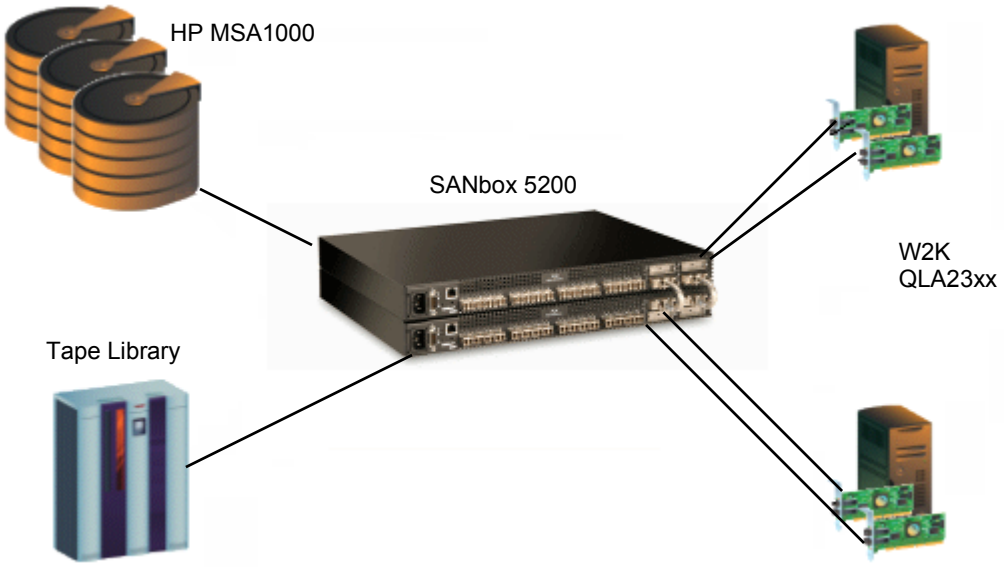
The following SAN illustrations show several different configurations and components certified by QLogic. Your configuration details may differ.

NOTE: For information on multi-vendor switch configuration, please see the *Switch Interoperability Guide* at http://www.qlogic.com/interopguide.

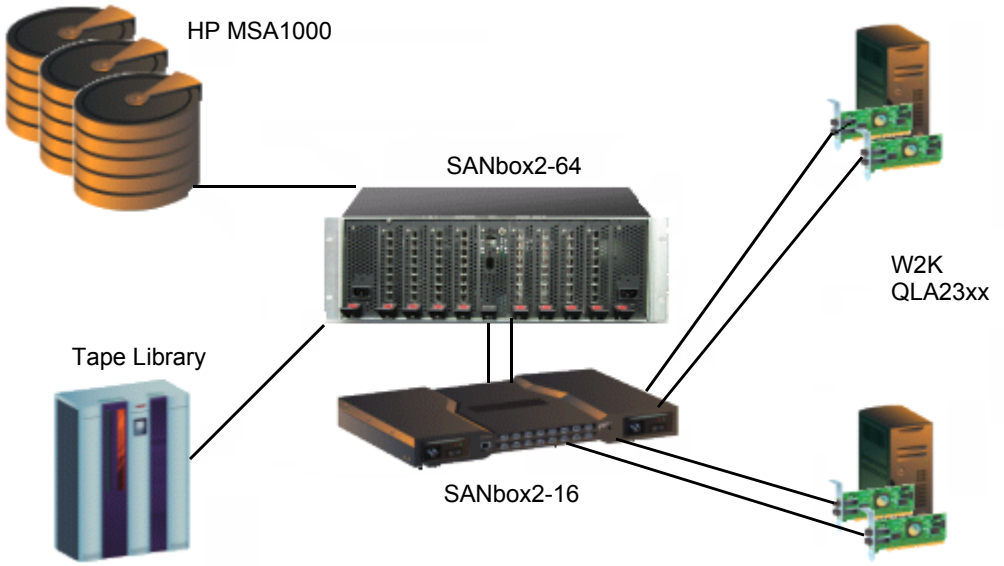
Single-Switch Configuration: SANbox2-64



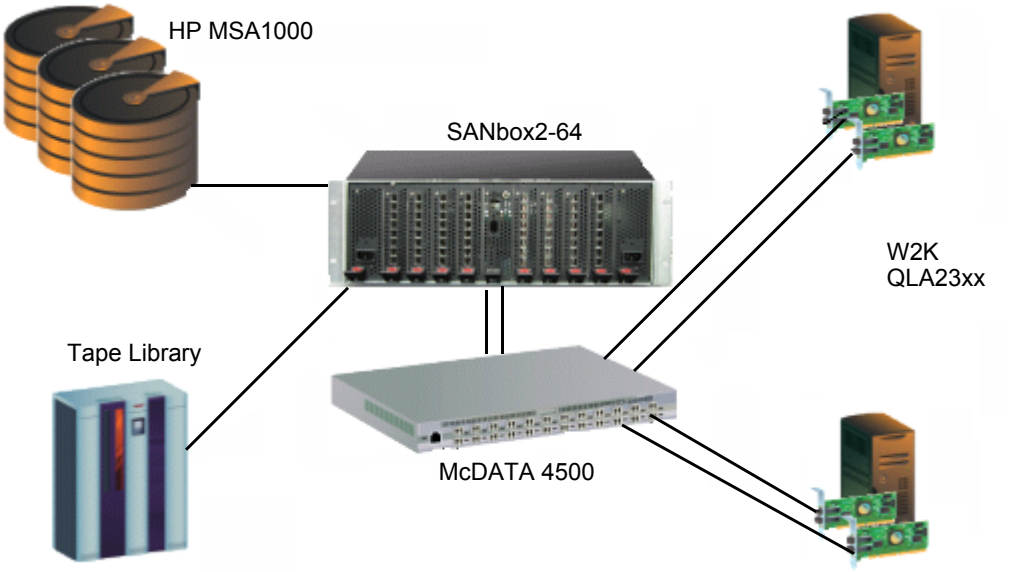
Cascade Configuration: SANbox 5200



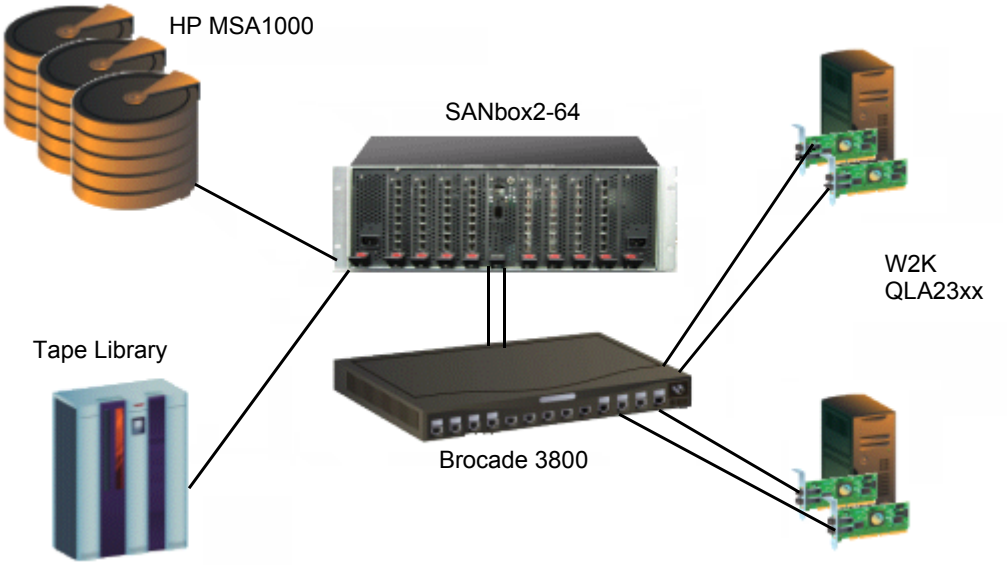
Cascade Configuration: SANbox2-16 and SANbox2-64



Cascade Configuration: SANbox2-64 and McDATA 4500



Cascade Configuration: SANbox2-64 and Brocade 3800



Driver and Firmware Levels

The following driver and firmware levels were used during QLogic certification testing. As new levels of software are released, they will be supported. See the QLogic website for the latest drivers, software, and manuals: http://www.qlogic.com/support/drivers_software.asp.

QLogic SANblade HBAs

Model	Windows Driver	BIOS
QLA2310	8.2.3.11 or above	1.33 or above
QLA2340	8.2.3.11 or above	1.33 or above
QLA2342	8.2.3.11 or above	1.33 or above

Switches

Manufacturer	Model	Firmware	SANbox Manager
QLogic	SANbox 5200	4.0.0.11 or above	4.00.10 or above
QLogic	SANbox2-64	1.5.0.07 or above	1.05.14 or above
QLogic	SANbox2-16	1.5.0.07 or above	1.05.14 or above
QLogic	SANbox2-8	1.5.0.07 or above	1.05.14 or above
McDATA	Sphereon 4500	040102 4 or above	Not applicable
Brocade	Silkworm 3800	3.0.2J or above	Not applicable
Brocade	Silkworm 3200	3.0.2J or above	Not applicable

HP Storage

Model	Microcode
StorageWorks MSA1000	2.38 Build 122

Application Software

Application	Vendor	Version
SANsurfer™ Management Suite CD	QLogic	2.0.23 or above
SANbox® Manager	QLogic	1.05.14 or above (SANbox2 Series) 4.00.10 or above (SANbox 5200 Series)
SANblade™ Manager	QLogic	2.0.23 or above
NetBackup	VERITAS	4.5

Operating Systems

Operating System	Version	Service Pack/Patch
Microsoft Windows	2000 Server	SP3 or above

Libraries and Tape Drives

Manufacturer*	Model	Microcode
StorageTek	L180 Tape Library	3.02.11 or above
StorageTek	9940A Tape Drive	1.30.212 or above

* These libraries and tape drives were tested during QLogic certification but procedures are not available. Please check with your tape or library vendor representative for more information.

SAN Setup and Configuration

The following section of the *QLogic SAN Configuration Guide for HP Storage* walks you through the setup and configuration of your storage, servers, and storage network. Once you have completed these steps, additional procedures illustrate how to connect the host and storage ports to the networks, and how to validate your storage network connections.

In most cases, the SAN setup and configuration proceeds in this order:

1. Server Configuration
2. Storage Network Configuration
3. Storage Configuration

After the configuration steps, complete the process by:

- Testing Your SAN

Server Configuration

This section walks you through the steps needed to ready your server for connection to the storage network, including information on:

- Fibre Channel HBAs from QLogic
- Installing and configuring HBA drivers
- Installing the HBA and switch device management application (SANsurfer Management Suite)
- Configuring the HBA with appropriate settings

Once you have completed the steps in this section, you can continue to set up the storage network, configure the storage, and connect to the fabric.

Fibre Channel HBAs Overview

The award-winning QLogic SANblade 2300 Series Fibre Channel HBAs offer 2Gb performance for demanding SANs and are available in PCI-X form factor, which is backwards compatible to PCI. QLogic SANblade HBAs are the industry's highest-performing and most widely deployed host adapter solutions for server, networking, storage and clustering solutions.

The SANblade 2300 Series architecture is the result of more than 15 years of progressive development and testing. The QLogic proven architecture delivers higher overall reliability and enables advanced functionality with its single chip integration, placing QLogic years ahead of its competitors. The SANblade 2300 also has proven interoperability with all major software applications, hardware platforms and operating systems.

The QLogic QLA23xx HBAs tested with the HP storage systems are:

- QLA234x
- QLA2310

Assumptions

The following procedures assume that:

- You have installed the HBA device into the system according to specifications in the hardware installation guide provided with the HBA. For more information, see the SANblade user manual at: http://www.qlogic.com/support/home_resources.asp?id=76.
- Your operating system and appropriate patches have been installed to meet the software and driver requirements for all components. For more information, see “Driver and Firmware Levels” on page 17.

Installing HBA Drivers

The following sections illustrate how to:

- Windows 2000 HBA Driver
- Windows 2000 HBA Pseudo LUN Driver

Windows 2000 HBA Driver

The QLA23*xx* HBAs are plug-and-play devices automatically detected by Windows 2000.

1. Download the latest driver from the **Download** section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and extract them.
2. Windows 2000 detects the newly installed device, then displays the Found New Hardware Wizard message. Click **Next** to begin the driver installation.
3. When prompted, select **Search for a suitable driver for my device (recommended)** and click **Next**.

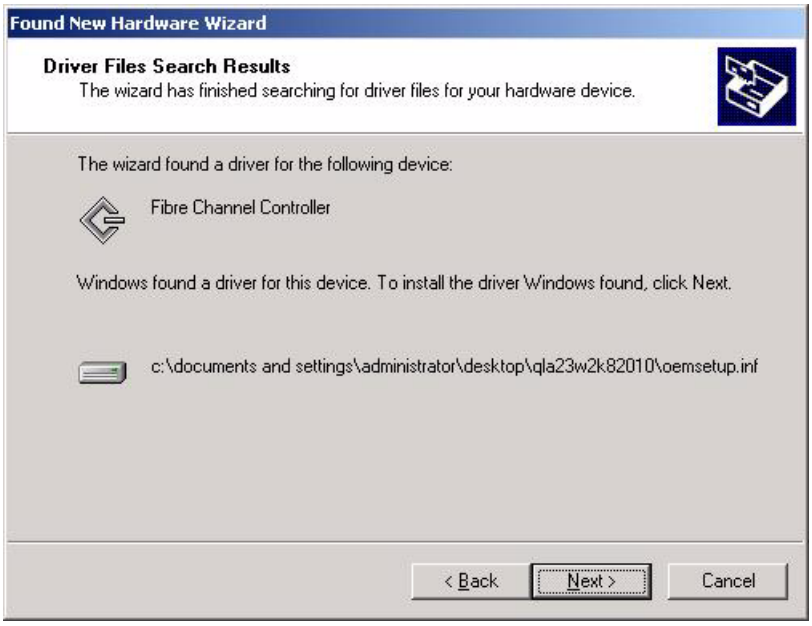
Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
Fibre Channel Controller
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

4. Check **Specify a location** and click **Next:**

Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
Fibre Channel Controller
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

5. Browse to the directory containing the driver and click **OK**:

6. When the **Driver Files Search Results** display, click **Next**:


Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
Fibre Channel Controller
Windows found a driver for this device. To install the driver Windows found, click Next.
c:\documents and settings\administrator\desktop\qla23w2k82010\oemsetup.inf
< Back
Next >
Cancel

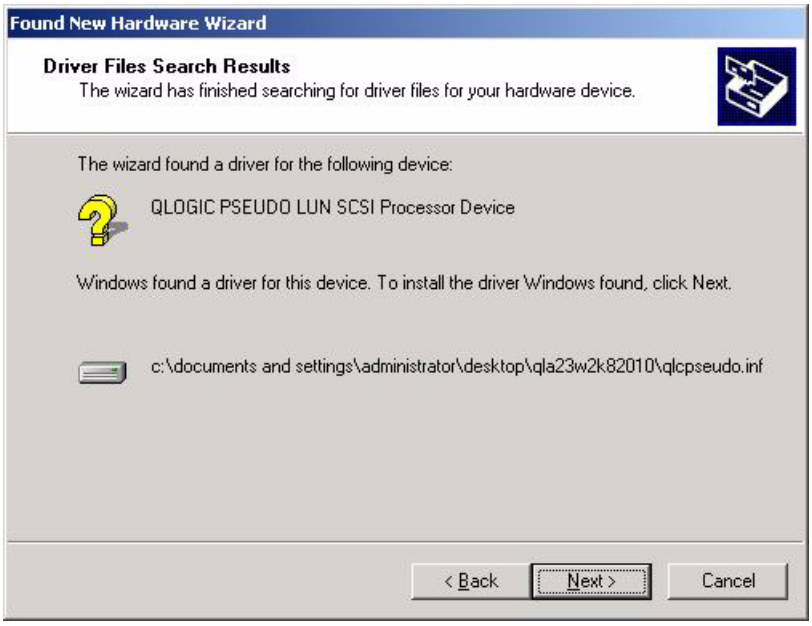
7. Click **Finish** to complete the installation.

Windows 2000 HBA Pseudo LUN Driver

Windows 2000 detects the newly installed device automatically.

1. Click **Next** to begin the driver installation from the Found New Hardware Wizard message.
2. When prompted, select **Search for a suitable driver for my device (recommended)** and click **Next**.
3. Check **Specify a location** and click **Next.**
4. Browse to the directory containing the driver and click **OK**.

5. When the **Driver Files Search Results** display, click **Next**:


Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
QLOGIC PSEUDO LUN SCSI Processor Device
Windows found a driver for this device. To install the driver Windows found, click Next.
c:\documents and settings\administrator\desktop\qla23w2k82010\qlcpseudo.inf
< Back
Next >
Cancel

6. Click **Finish** to complete the installation.

SANsurfer Management Suite

The SANsurfer Management Suite CD contains both the SANblade Manager (HBA management) and SANbox Manager (switch management). These applications are used to configure the QLogic HBAs and switches.

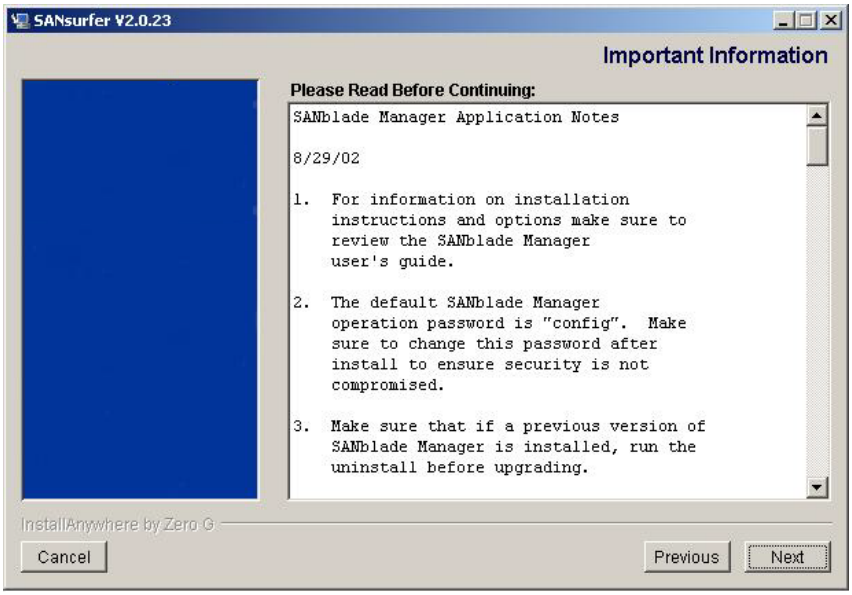
The following procedures show you how to install both SANbox Manager and SANblade Manager, though you use only the SANblade Manager at this time. When you configure switches later, you can access the SANbox Manager.

Installing SANsurfer Management Suite on Windows

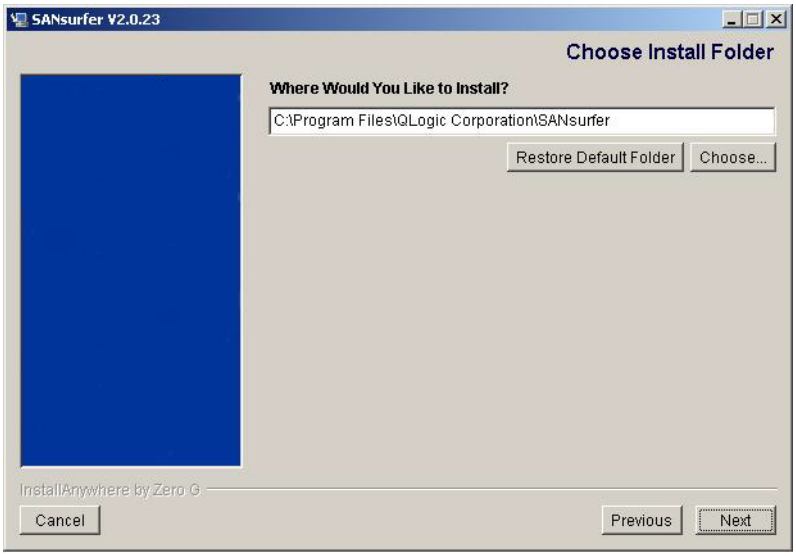
1. Download the latest version from the Download section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and double click the icon to start the installation.
2. When the Introduction dialog displays, click **Next**.
3. Select the option to install **Both GUIs (Blade/Box) and Agent**. Click **Next**.

SANsurfer V2.0.23
Choose Product Features
Both GUIs (Blade/Box) and Agent
This will install both the SANblade and SANbox Manager GUIs including the NT Agent.
SANblade Manager GUI
This will install only the SANblade Manager GUI.
SANbox Manager GUI
SANbox Manager GUI
SANblade NT Agent
SANblade Manager Windows NT 4/2000 Agent.
SANblade Netware 5/6.x Agent
SANblade Manager Novell Netware 5/6.x and Above Agent.
Custom
Choose this option to customize the components to be installed.
InstallAnywhere by Zero G
Cancel
Previous
Next

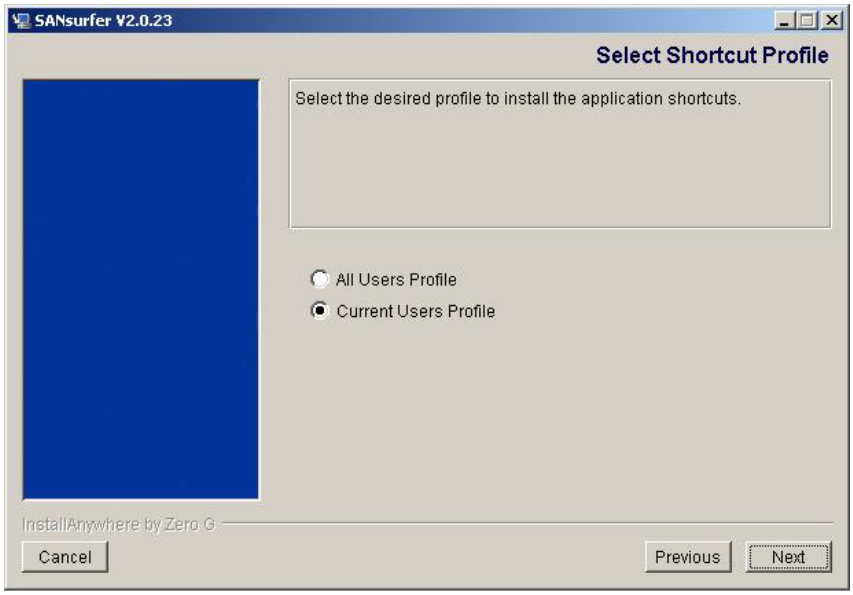
4. Read the **Application Notes** carefully and click **Next** when you're ready:


SANsurfer V2.0.23
Important Information
Please Read Before Continuing:
SANblade Manager Application Notes
8/29/02
1. For information on installation instructions and options make sure to review the SANblade Manager user's guide.
2. The default SANblade Manager operation password is "config". Make sure to change this password after install to ensure security is not compromised.
3. Make sure that if a previous version of SANblade Manager is installed, run the uninstall before upgrading.
InstallAnywhere by Zero G
Cancel
Previous
Next

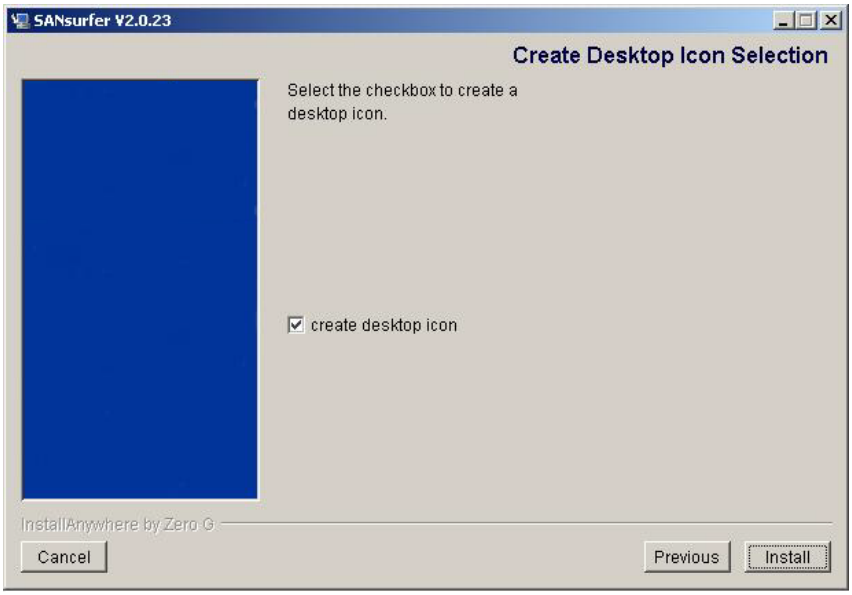
5. Edit the path where you want to install the software or click **Choose** and browse to the location. Click **Next**:



6. Select the **Shortcut Profile** you wish to use. Click **Next**:



7. Check **Create a Desktop Icon** if you wish. Click **Install**:



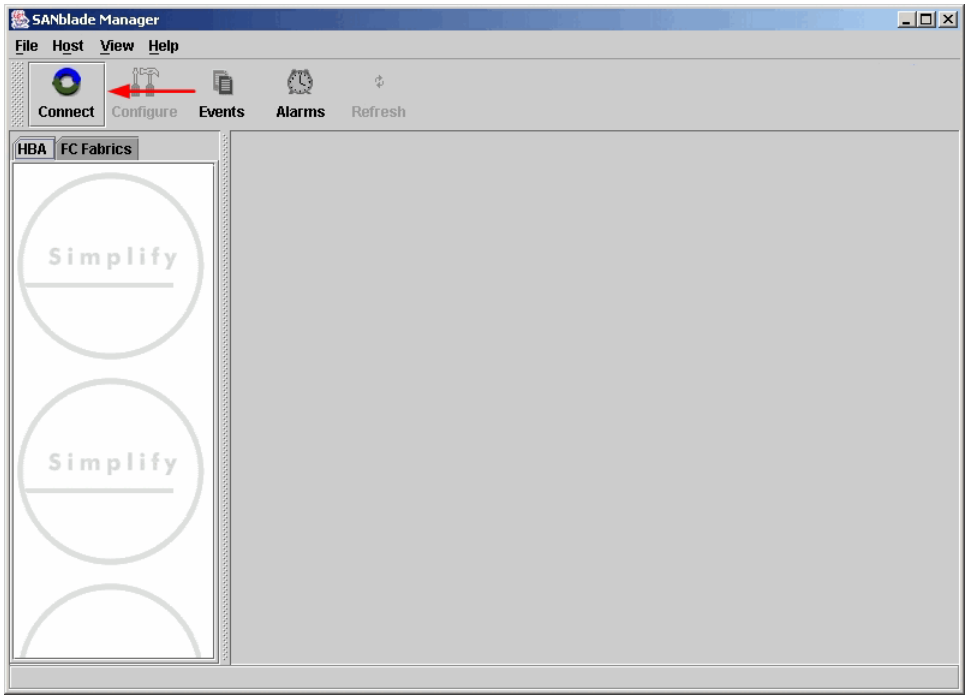
8. Click **Done** when the installation process completes.

Configuring the HBA

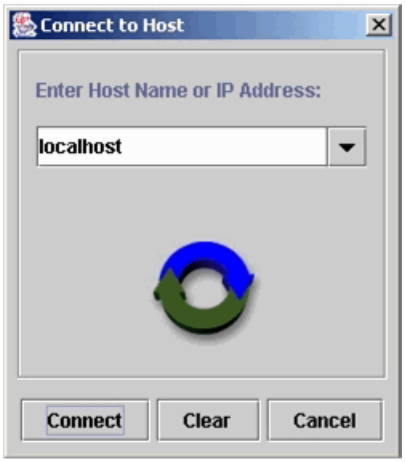
The following section illustrates how to configure the HBA on Windows 2000 Server.

Configuring the HBA on Windows 2000 Server

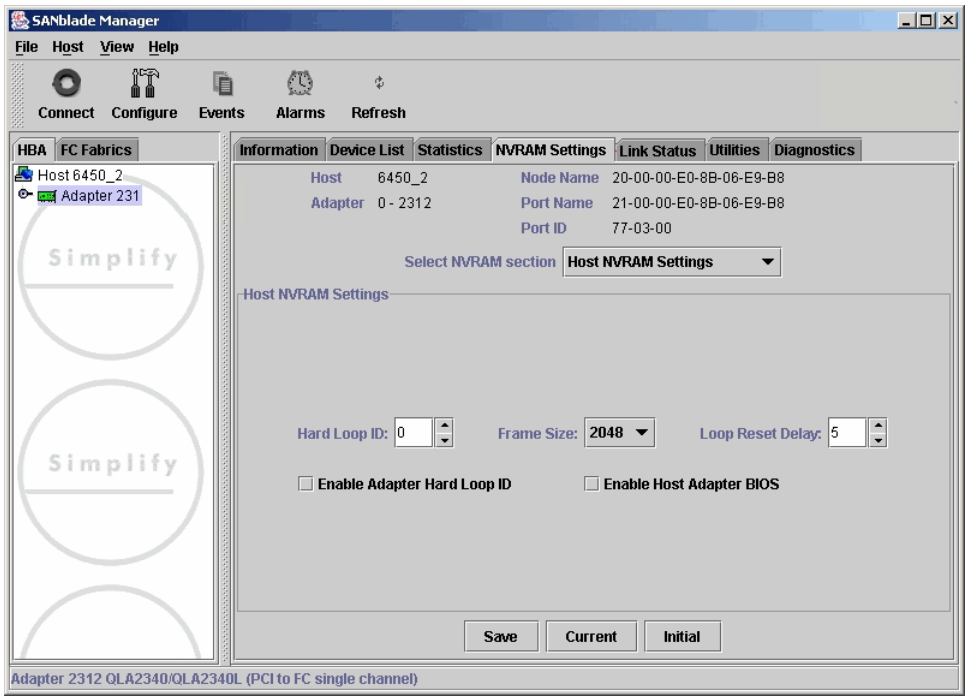
1. Launch SANsurfer.
2. From the SANblade Manager, click **Connect** on the toolbar:



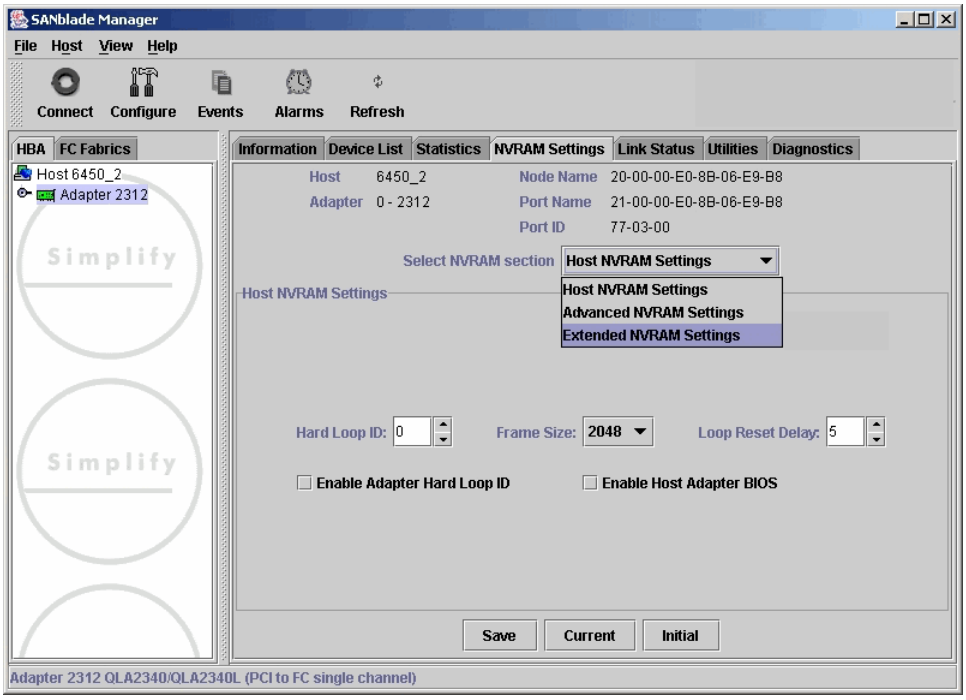
3. From the **Connect to Host** dialog, select the host from the list and click **Connect**:



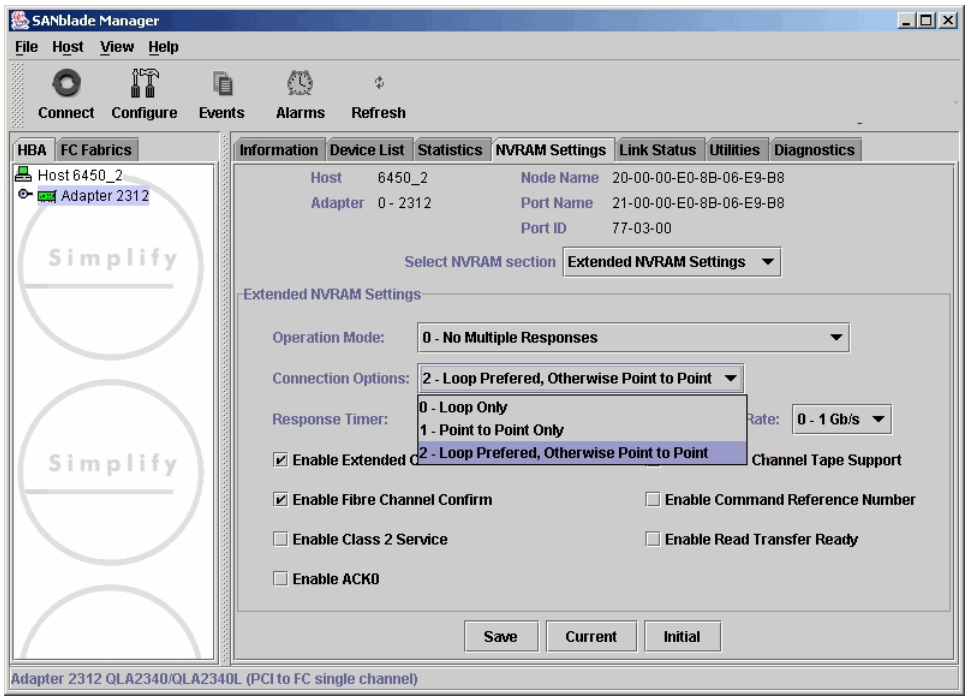
4. From the SANblade Manager, select the adapter in the left frame and select the **NVRAM Settings** tab in the right frame:


SANblade Manager
File Host View Help
Connect Configure Events Alarms Refresh
HBA FC Fabrics
Host 6450_2
Adapter 231
Information Device List Statistics NVRAM Settings Link Status Utilities Diagnostics
Host 6450_2
Adapter 0 - 2312
Node Name 20-00-00-E0-8B-06-E9-B8
Port Name 21-00-00-E0-8B-06-E9-B8
Port ID 77-03-00
Select NVRAM section Host NVRAM Settings
Host NVRAM Settings
Hard Loop ID: 0
Frame Size: 2048
Loop Reset Delay: 5
Enable Adapter Hard Loop ID
Enable Host Adapter BIOS
Save Current Initial
Adapter 2312 QLA2340/QLA2340L (PCI to FC single channel)

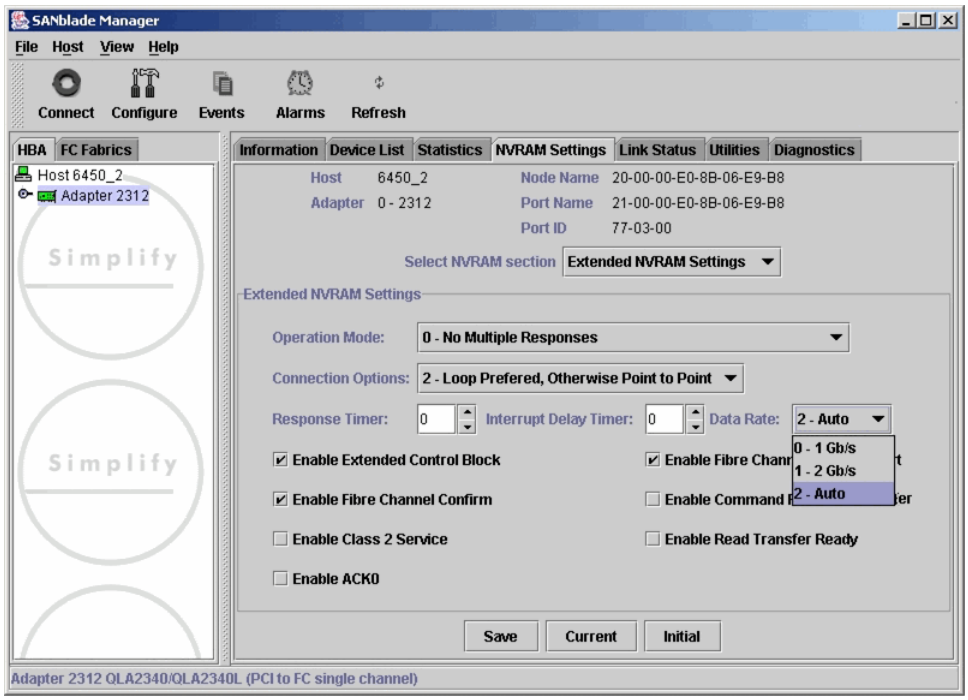
5. Click the **NVRAM Settings** tab and choose **Extended NVRAM Settings** from the **Select NVRAM Section** list:



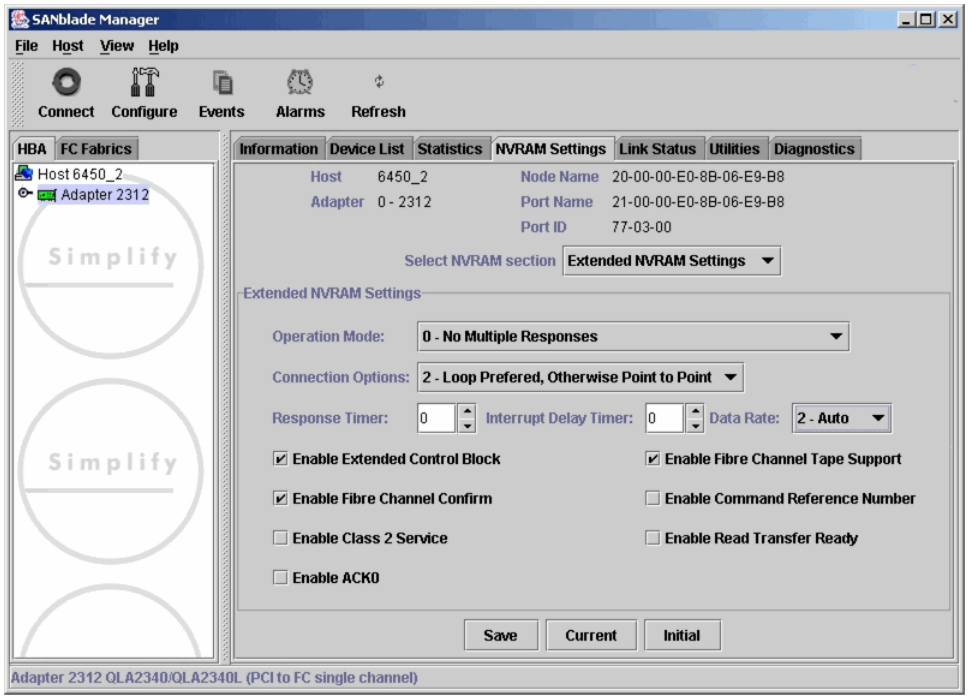
6. Select the connection type from the **Connections Options** list:


SANblade Manager
File Host View Help
Connect Configure Events Alarms Refresh
HBA FC Fabrics
Host 6450_2
Adapter 2312
Information Device List Statistics NVRAM Settings Link Status Utilities Diagnostics
Host 6450_2
Adapter 0 - 2312
Node Name 20-00-00-E0-8B-06-E9-B8
Port Name 21-00-00-E0-8B-06-E9-B8
Port ID 77-03-00
Select NVRAM section Extended NVRAM Settings
Extended NVRAM Settings
Operation Mode: 0 - No Multiple Responses
Connection Options: 2 - Loop Prefered, Otherwise Point to Point
0 - Loop Only
1 - Point to Point Only
2 - Loop Prefered, Otherwise Point to Point
Response Timer:
Rate: 0 - 1 Gb/s
Enable Extended C
Channel Tape Support
Enable Fibre Channel Confirm
Enable Command Reference Number
Enable Class 2 Service
Enable Read Transfer Ready
Enable ACK0
Save Current Initial
Adapter 2312 QLA2340/QLA2340L (PCI to FC single channel)

7. Select the connection speed from the **Data Rate** list:



8. Check **Enable FC Tape Support**:


SANblade Manager
File Host View Help
Connect Configure Events Alarms Refresh
HBA FC Fabrics
Host 6450_2
Adapter 2312
Information Device List Statistics NVRAM Settings Link Status Utilities Diagnostics
Host 6450_2
Adapter 0 - 2312
Node Name 20-00-00-E0-8B-06-E9-B8
Port Name 21-00-00-E0-8B-06-E9-B8
Port ID 77-03-00
Select NVRAM section Extended NVRAM Settings
Extended NVRAM Settings
Operation Mode: 0 - No Multiple Responses
Connection Options: 2 - Loop Prefered, Otherwise Point to Point
Response Timer: 0 Interrupt Delay Timer: 0 Data Rate: 2 - Auto
Enable Extended Control Block
Enable Fibre Channel Tape Support
Enable Fibre Channel Confirm
Enable Command Reference Number
Enable Class 2 Service
Enable Read Transfer Ready
Enable ACK0
Save Current Initial
Adapter 2312 QLA2340/QLA2340L (PCI to FC single channel)

9. Click **Save**.
10. Enter the **Password** in the Security Check dialog box:

NOTE: The default password is "config". Contact your System Administrator if the password was changed.

11. Click **OK** to close the NVRAM Save confirmation message:

NVRAM Save
NVRAM Save Complete
Changes have been saved to the adapter.
You must reboot in order for changes to take effect.
OK

Storage Network Configuration

This section provides instructions to set up and configure the QLogic Fibre Channel switches in the SANbox 5000 Series and SANbox2 Series. Completing the configuration steps in this section prepares the network for host and storage connections.

Fibre Channel Switches from QLogic

Deployed as standalone units or in multi-stage fabrics of any size, QLogic SANbox switches come with all the software tools necessary to create easy-to-manage, resilient and intelligent SANs. For additional information, see http://www.qlogic.com/products/fc_san_switchs.asp.

SANbox 5000 Series Stackable Switches

The SANbox 5200 is the first switch in the new SANbox 5000 Series, providing the benefits of stackable IP switches for your SAN. It delivers the seamless scalability and performance of a chassis switch in an easy-to-manage, pay-as-you-grow solution. With up to sixteen 2Gb ports plus a four-pack of high-speed 10Gb ISL ports, each 5200 stackable switch provides maximum flexibility for configuring, managing and scaling SANs.

SANbox2 Switches

All the SANbox2 switches offer a scalable, highly available solution to protect the investment in your SAN backbone. The next-generation SANbox2 switches bring performance, reliability and simplicity to storage networking. The SANbox2-64 switch is designed to meet the needs of your growing enterprise while the SANbox2-8 and SANbox2-16 switches offer twice the throughput of today's 1 Gb products at a lower cost of entry.

Configuration Overview

The basic steps to configure your SANbox switch are similar, whether you use the SANbox 5000 Series or the SANbox2 Series. Refer to the appropriate section for your switch:

- SANbox 5000 Series Configuration
- SANbox2 Configuration

After you have completed the configuration steps for your SANbox switch, the following sections provide guidelines for testing applicable to both the SANbox 5000 and SANbox2 Series switches:

- Testing Your SAN
  - Zone Verification
  - Test Configuration

SANbox 5000 Series Configuration

The following procedures explain how to configure the SANbox 5200 switch, verify the connections and test your configuration:

- Configuring the Switch
- Connecting Cables
- Configuring Zones

NOTE: The SANbox 5200 switch requires a later version of the SANbox Manager than what was available for download with the SANsurfer Management Suite when this guide was published. Be sure to verify the correct version before you configure the switch. Refer to “Application Software” on page 18.

Configuring the Switch

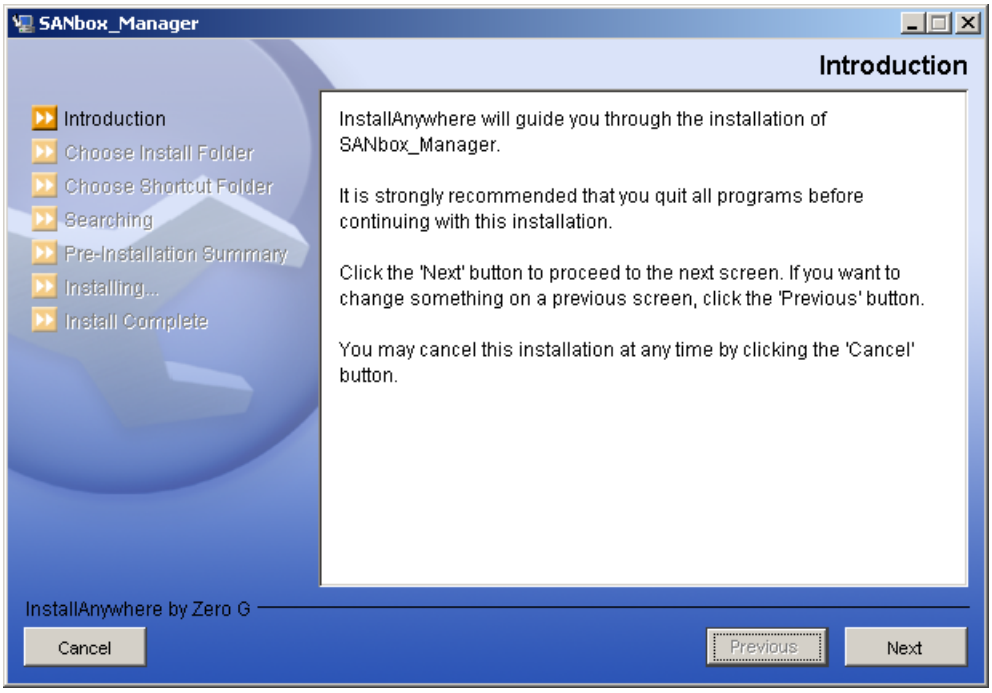
The following procedures explain how to configure the SANbox 5200 switch:

- Installing SANbox Manager
- Selecting Configuration Options
- Configuring Port Properties

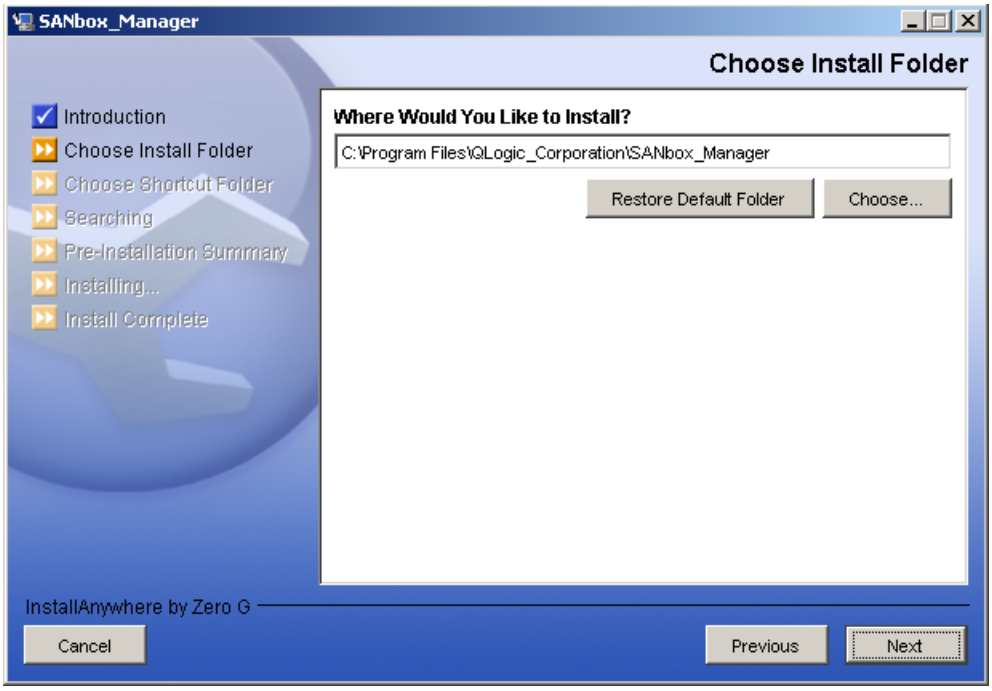
Installing SANbox Manager

NOTE: The following steps explain how to download and install the SANbox Manager separately from the SANsurfer Management Suite.

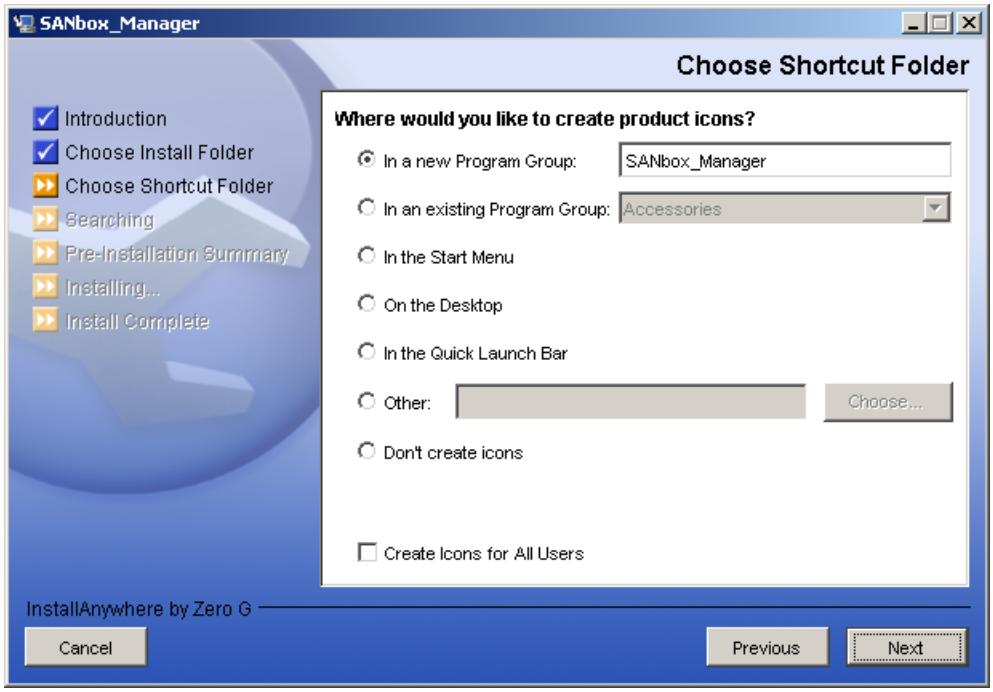
1. Download he SANbox Manager version required for the SANbox 5200 from the Download section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and double-click the icon to start the installation.
2. From the Introduction screen, click **Next**:


SANbox_Manager
Introduction
Introduction
Choose Install Folder
Choose Shortcut Folder
Searching
Pre-Installation Summary
Installing...
Install Complete
InstallAnywhere will guide you through the installation of SANbox_Manager.
It is strongly recommended that you quit all programs before continuing with this installation.
Click the 'Next' button to proceed to the next screen. If you want to change something on a previous screen, click the 'Previous' button.
You may cancel this installation at any time by clicking the 'Cancel' button.
InstallAnywhere by Zero G
Cancel
Previous
Next

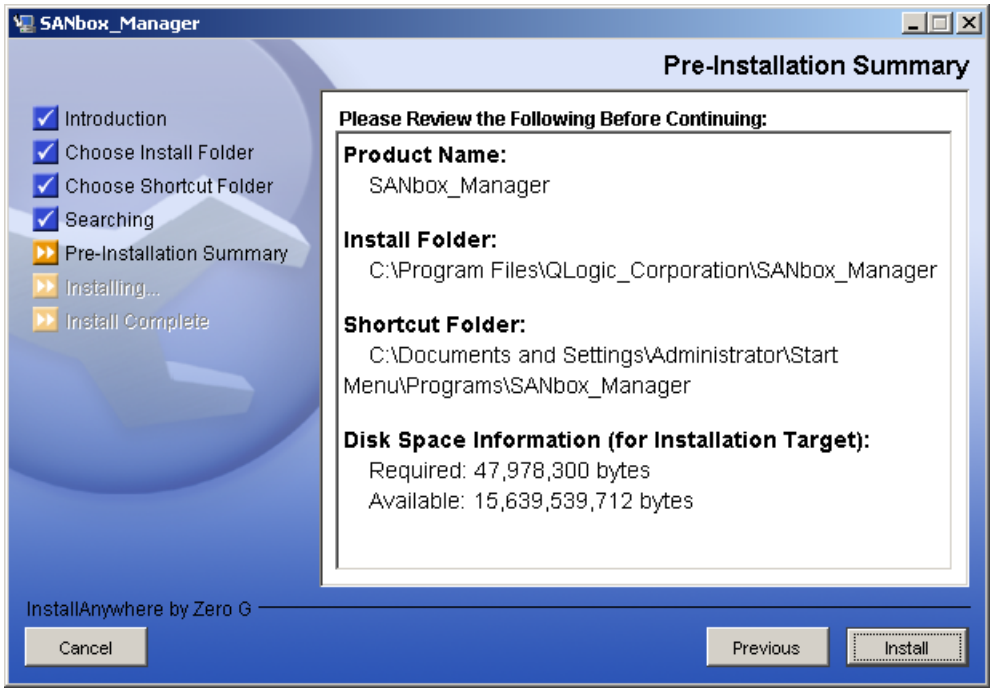
3. From the Choose Install Folder screen:
   a. Select an installation folder.
   b. Click **Next**.



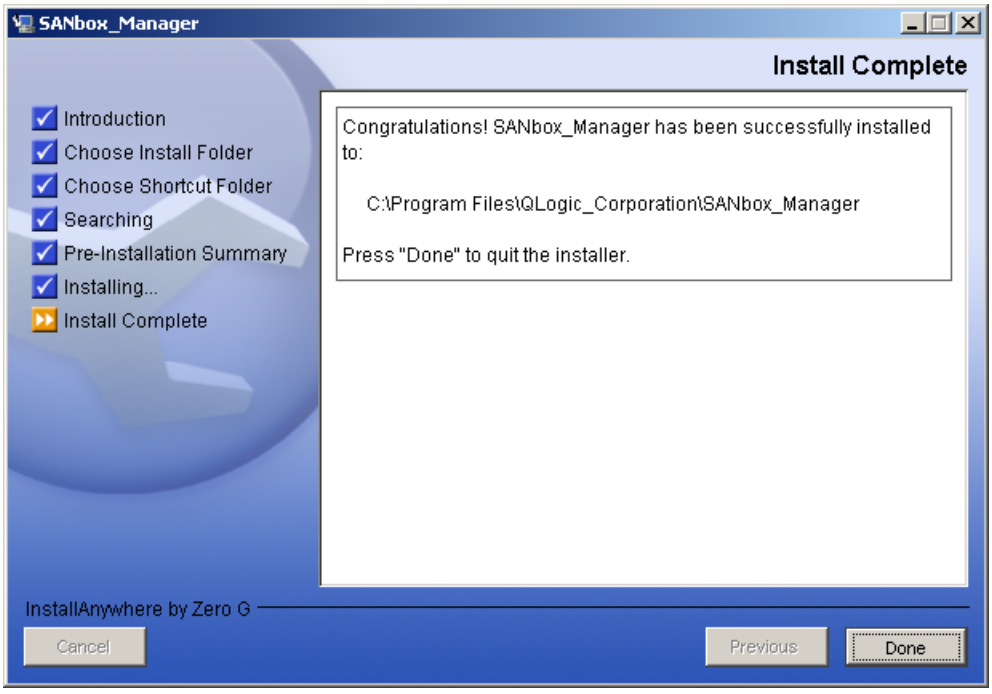
4. From the Choose Shortcut Folder window:
   a. Select a location for the SANbox Manager shortcut.
   b. Click **Next**.



5. From the Pre-Installation Summary screen, review the configuration information and click **Install** to start the installation.



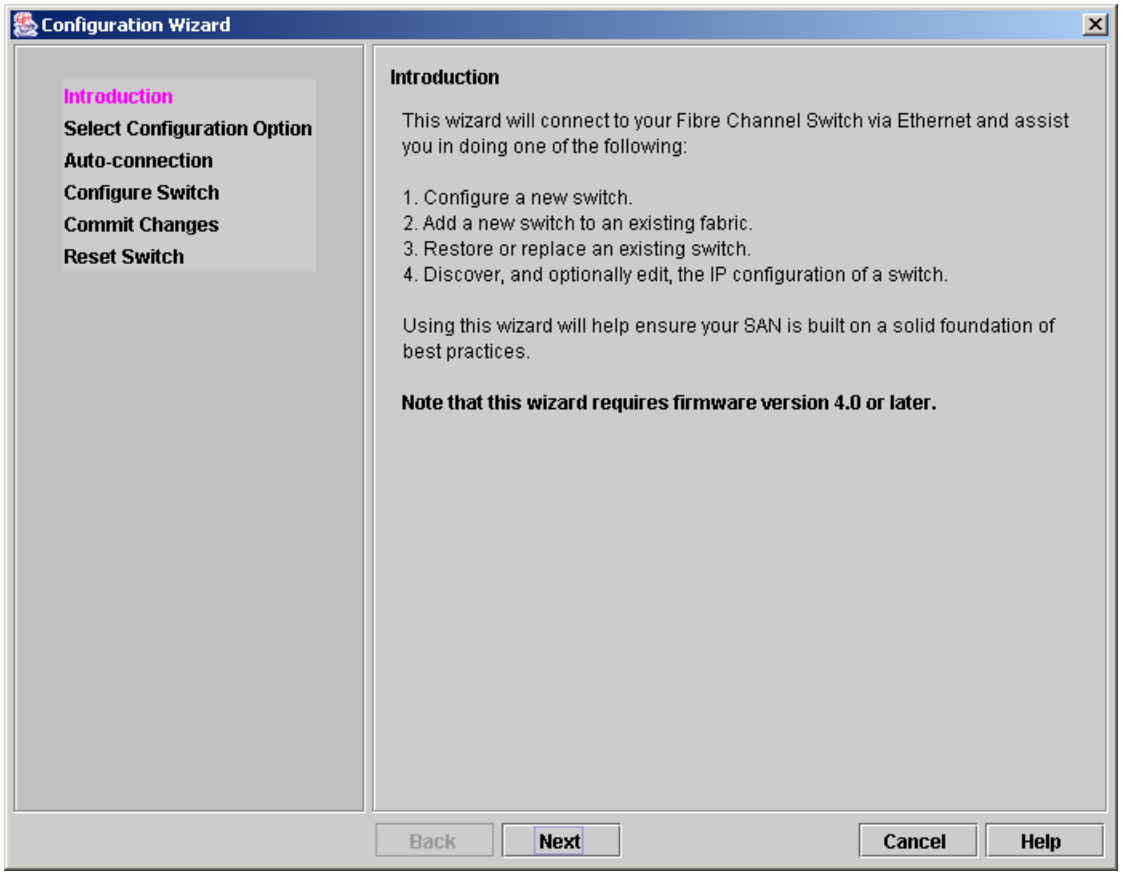
6. When you see the Installation Complete message, click **Done** to close the window.



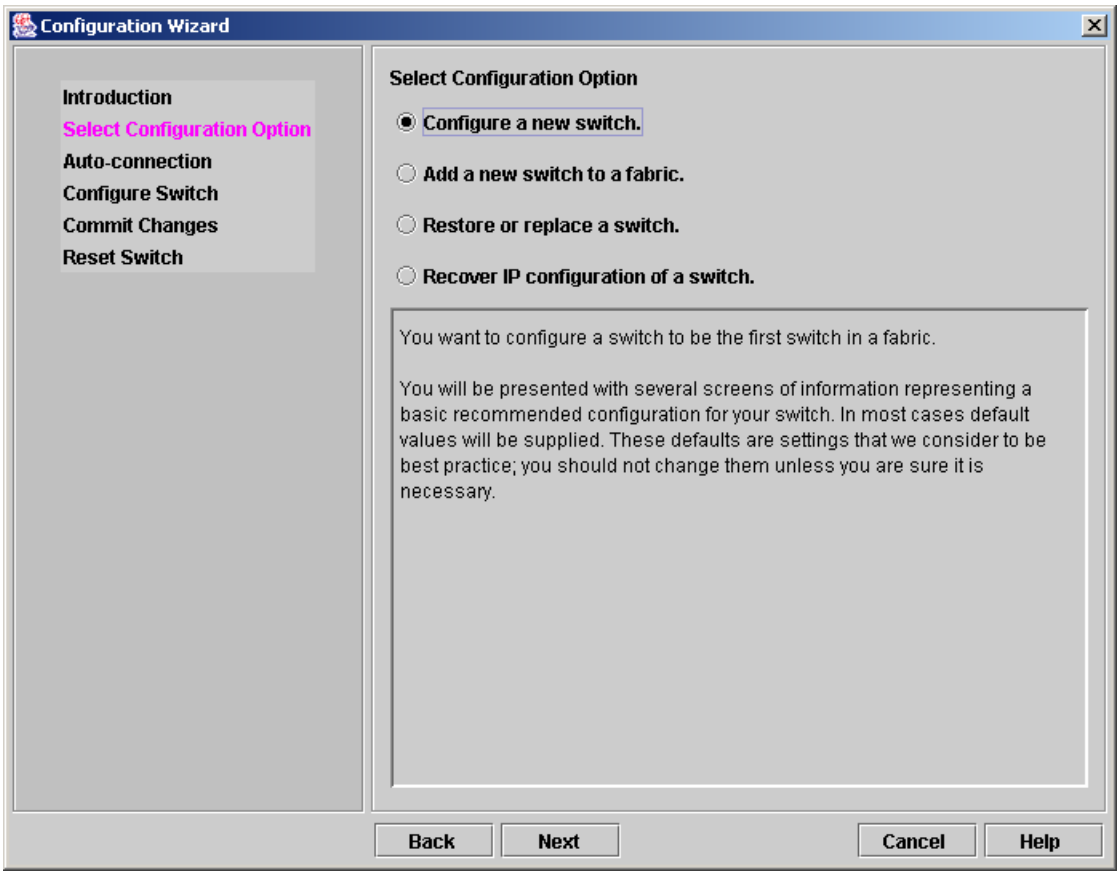
Selecting Configuration Options

1. Launch SANbox Manager.
2. From the Initial Start Dialog:
   a. Select **Open Configuration Wizard**.
   b. Click **Proceed**.

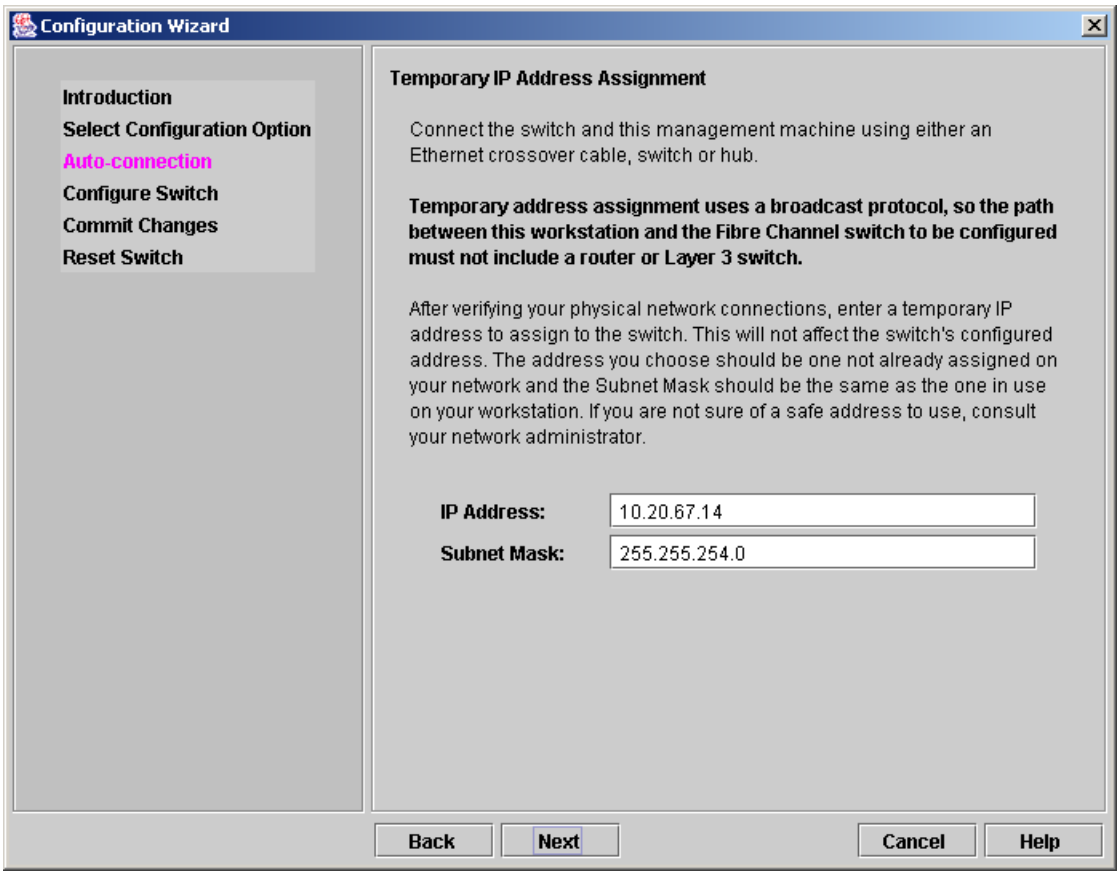
3. From the Introduction window, click **Next**:


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Introduction
This wizard will connect to your Fibre Channel Switch via Ethernet and assist you in doing one of the following:
1. Configure a new switch.
2. Add a new switch to an existing fabric.
3. Restore or replace an existing switch.
4. Discover, and optionally edit, the IP configuration of a switch.
Using this wizard will help ensure your SAN is built on a solid foundation of best practices.
Note that this wizard requires firmware version 4.0 or later.
Back
Next
Cancel
Help

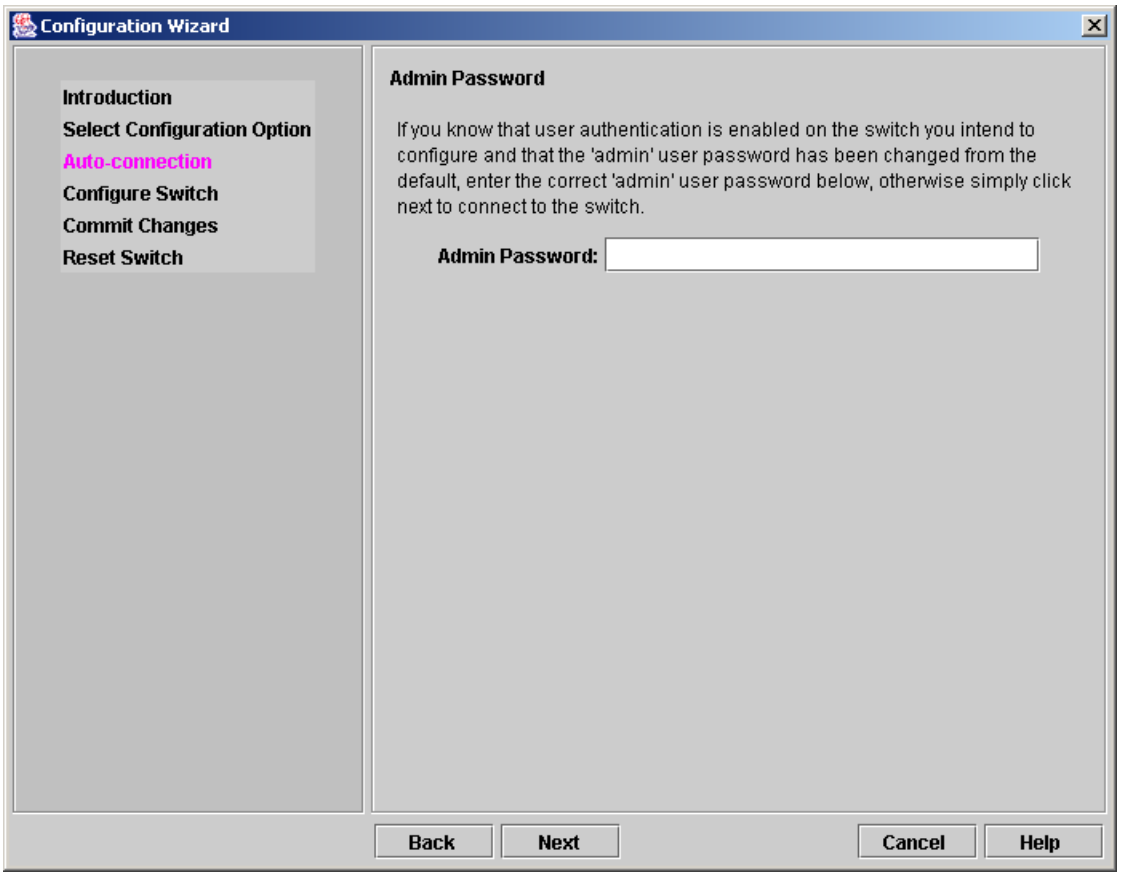
4. From the Select Configuration Option window:
   a. Select **Configure a new switch**.
   b. Click **Next**.


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Select Configuration Option
Configure a new switch.
Add a new switch to a fabric.
Restore or replace a switch.
Recover IP configuration of a switch.
You want to configure a switch to be the first switch in a fabric.
You will be presented with several screens of information representing a basic recommended configuration for your switch. In most cases default values will be supplied. These defaults are settings that we consider to be best practice; you should not change them unless you are sure it is necessary.
Back
Next
Cancel
Help

5. From the Temporary IP Address Assignment window:
   a. Enter a temporary IP Address and Subnet Mask.
   b. Click **Next**.

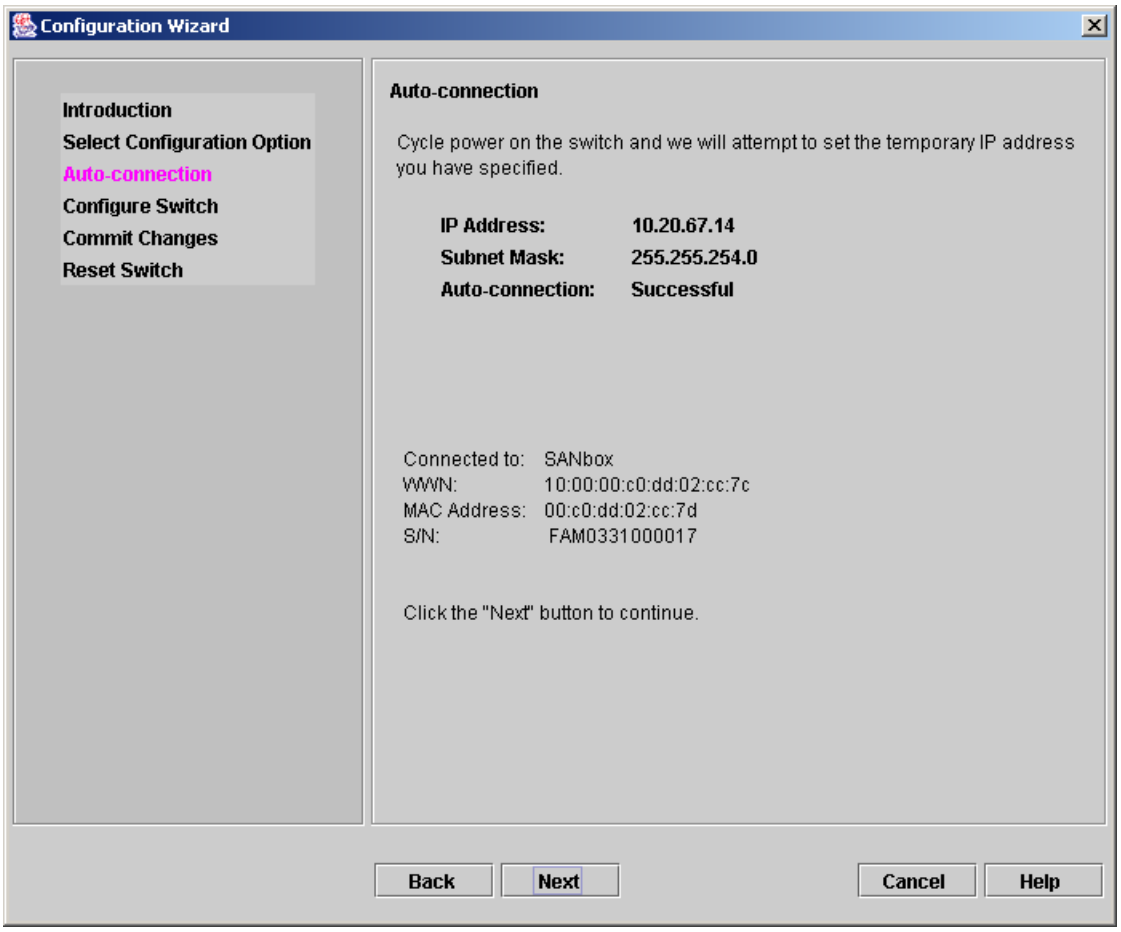

Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Temporary IP Address Assignment
Connect the switch and this management machine using either an Ethernet crossover cable, switch or hub.
Temporary address assignment uses a broadcast protocol, so the path between this workstation and the Fibre Channel switch to be configured must not include a router or Layer 3 switch.
After verifying your physical network connections, enter a temporary IP address to assign to the switch. This will not affect the switch's configured address. The address you choose should be one not already assigned on your network and the Subnet Mask should be the same as the one in use on your workstation. If you are not sure of a safe address to use, consult your network administrator.
IP Address:
10.20.67.14
Subnet Mask:
255.255.254.0
Back
Next
Cancel
Help

6. From the Admin Password window, click **Next**.

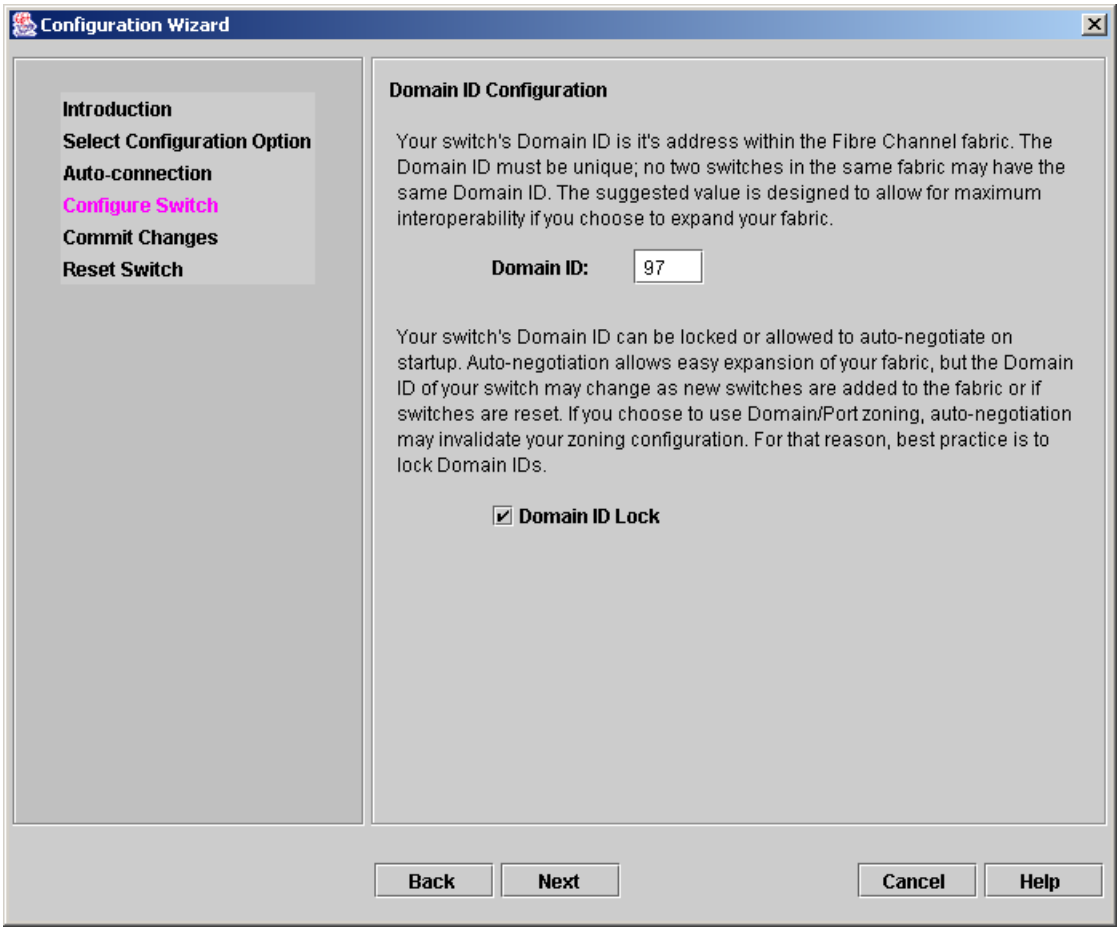

Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Admin Password
If you know that user authentication is enabled on the switch you intend to configure and that the 'admin' user password has been changed from the default, enter the correct 'admin' user password below, otherwise simply click next to connect to the switch.
Admin Password:
Back
Next
Cancel
Help

NOTE: User authentication is disabled by default.

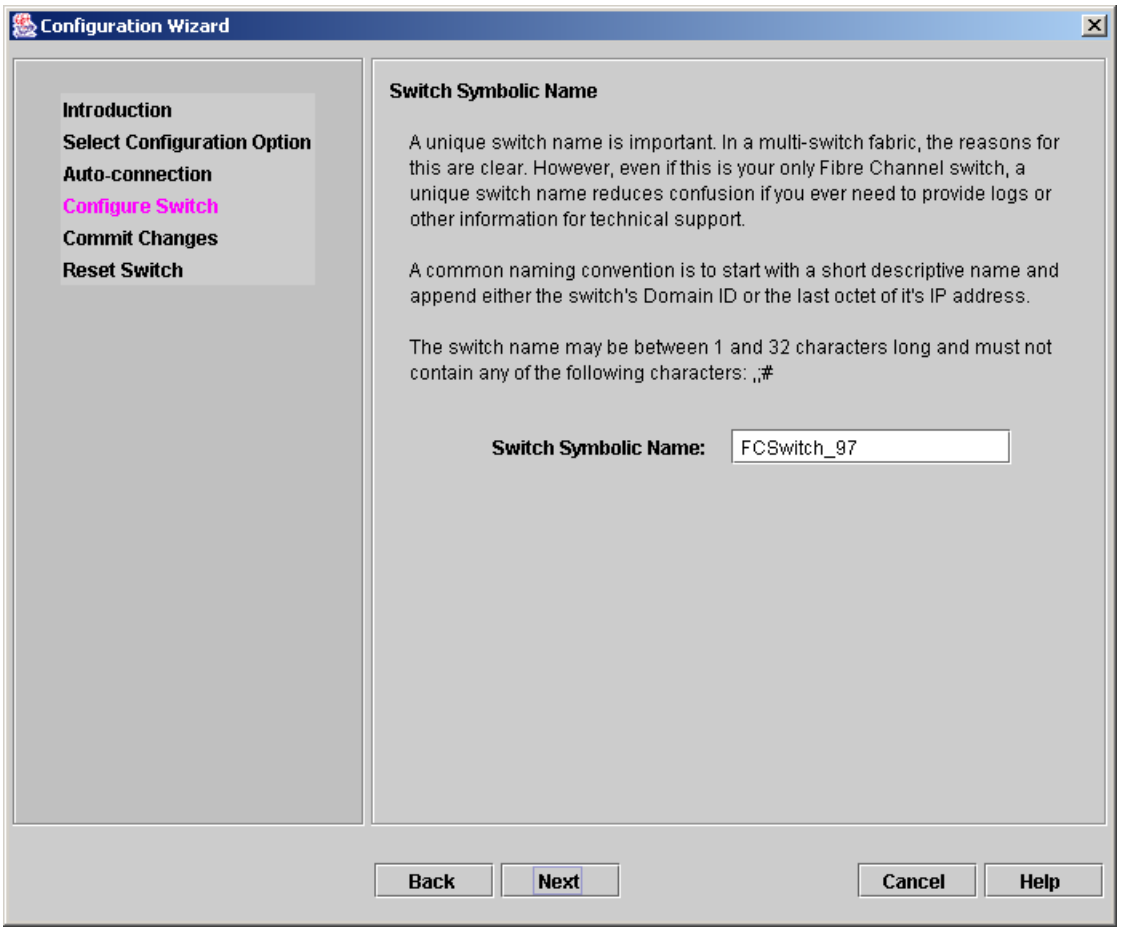
7. When the Auto-connection window displays:
   a. Power on or cycle power on the switch.
   b. When the new switch information appears in the window, click **Next**.



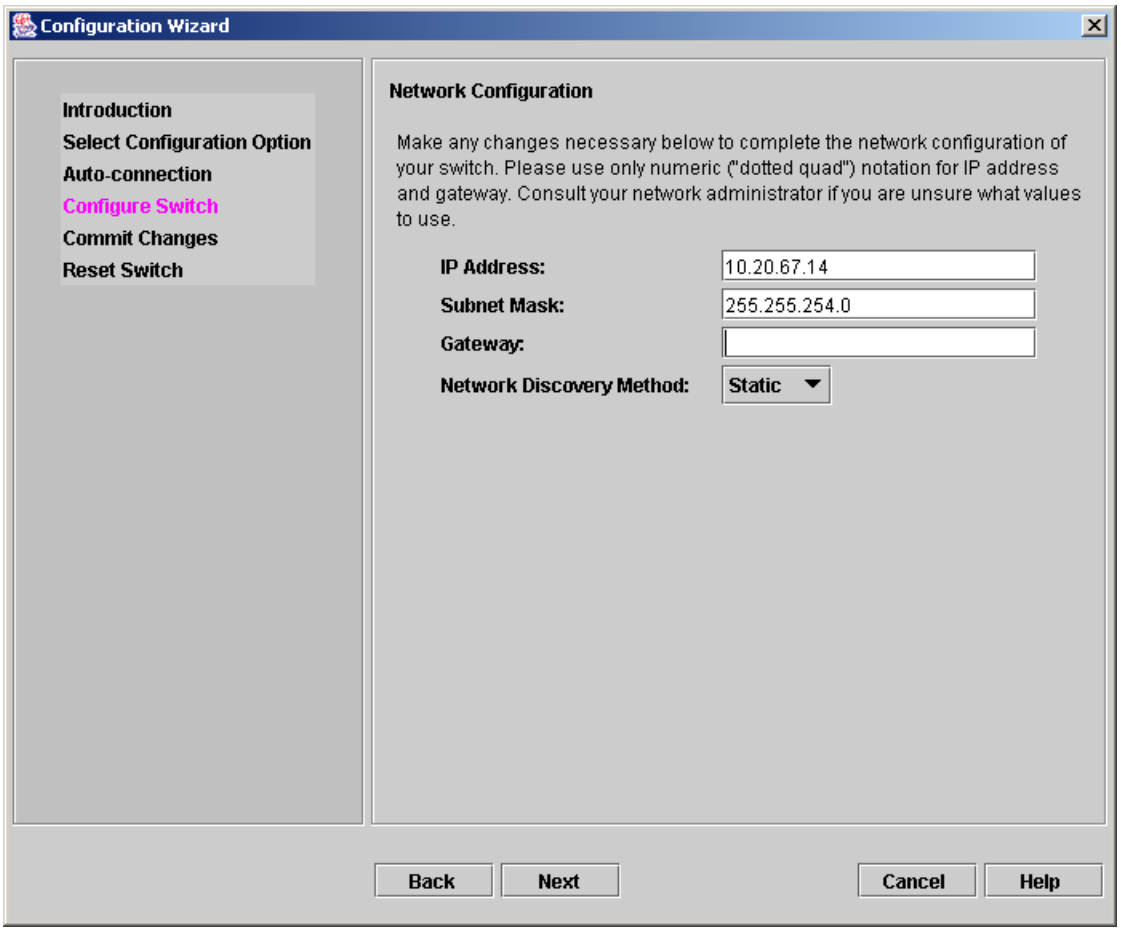
8. From the Domain ID Configuration window:
   a. Select the desired **Domain ID** (optional if Domain ID Lock disabled).
   b. Check **Domain ID Lock** if you want to hard set your Domain ID.
   c. Click **Next**.


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Domain ID Configuration
Your switch's Domain ID is it's address within the Fibre Channel fabric. The Domain ID must be unique; no two switches in the same fabric may have the same Domain ID. The suggested value is designed to allow for maximum interoperability if you choose to expand your fabric.
Domain ID:
97
Your switch's Domain ID can be locked or allowed to auto-negotiate on startup. Auto-negotiation allows easy expansion of your fabric, but the Domain ID of your switch may change as new switches are added to the fabric or if switches are reset. If you choose to use Domain/Port zoning, auto-negotiation may invalidate your zoning configuration. For that reason, best practice is to lock Domain IDs.
Domain ID Lock
Back
Next
Cancel
Help

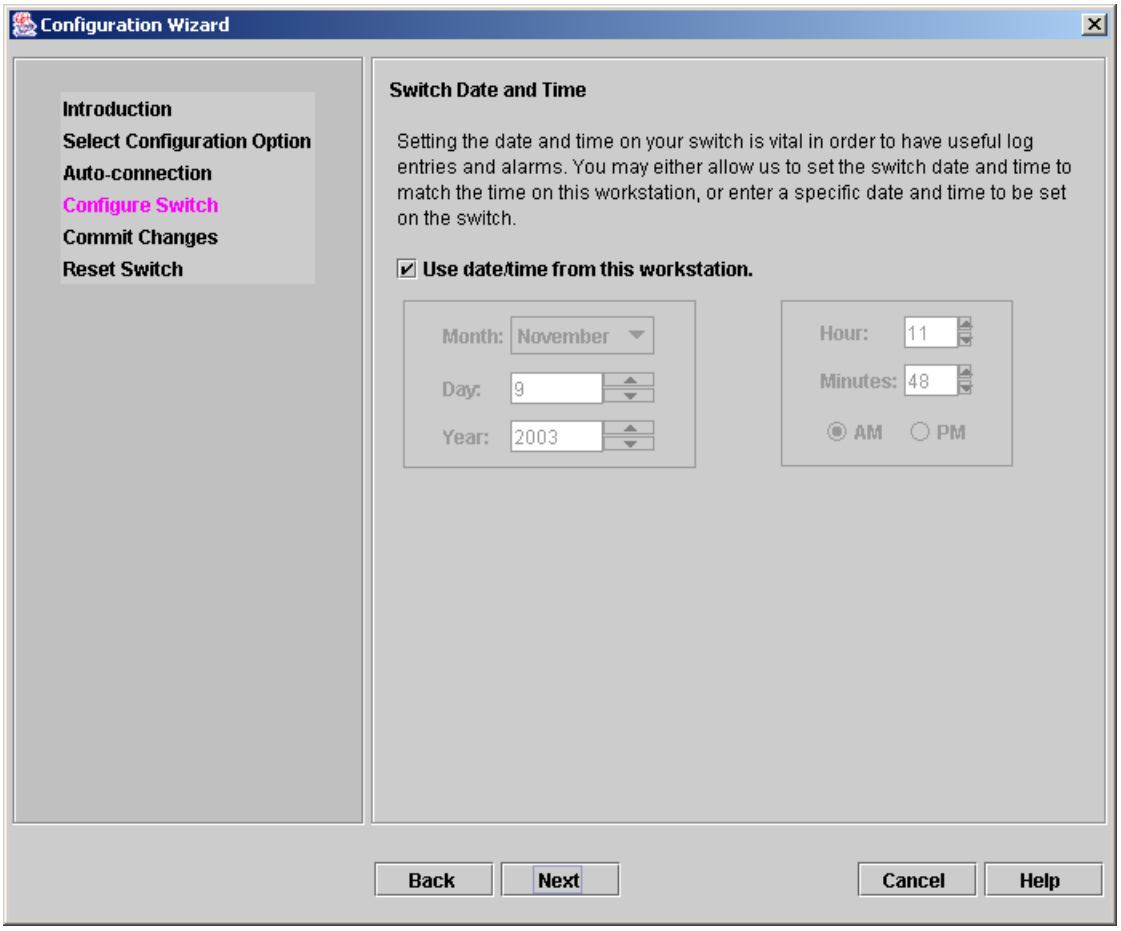
9. In the Switch Symbolic Name window:
   a. Enter a name for the switch.
   b. Click **Next**.


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Switch Symbolic Name
A unique switch name is important. In a multi-switch fabric, the reasons for this are clear. However, even if this is your only Fibre Channel switch, a unique switch name reduces confusion if you ever need to provide logs or other information for technical support.
A common naming convention is to start with a short descriptive name and append either the switch's Domain ID or the last octet of it's IP address.
The switch name may be between 1 and 32 characters long and must not contain any of the following characters: ,;#
Switch Symbolic Name:
FCSwitch_97
Back
Next
Cancel
Help

10. From the Network Configuration window:
    a. Enter the desired IP Address and other network information.
    b. Click **Next**.

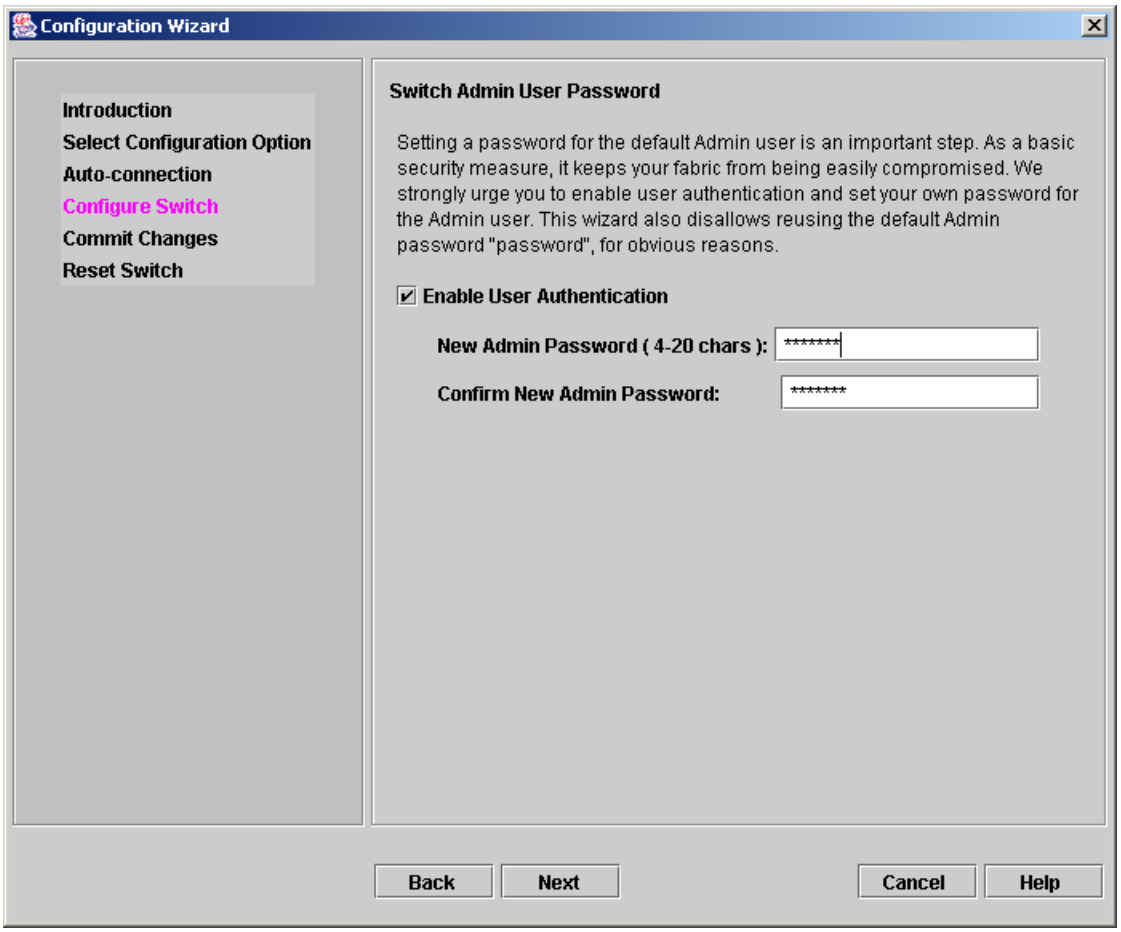


11. From the Switch Date and Time window:
    a. Check **Use date/time from this workstation** *or* manually enter the date and time for the switch if you are not using the local system information.
    b. Click **Next**.


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Switch Date and Time
Setting the date and time on your switch is vital in order to have useful log entries and alarms. You may either allow us to set the switch date and time to match the time on this workstation, or enter a specific date and time to be set on the switch.
Use date/time from this workstation.
Month: November
Day: 9
Year: 2003
Hour: 11
Minutes: 48
AM
PM
Back
Next
Cancel
Help

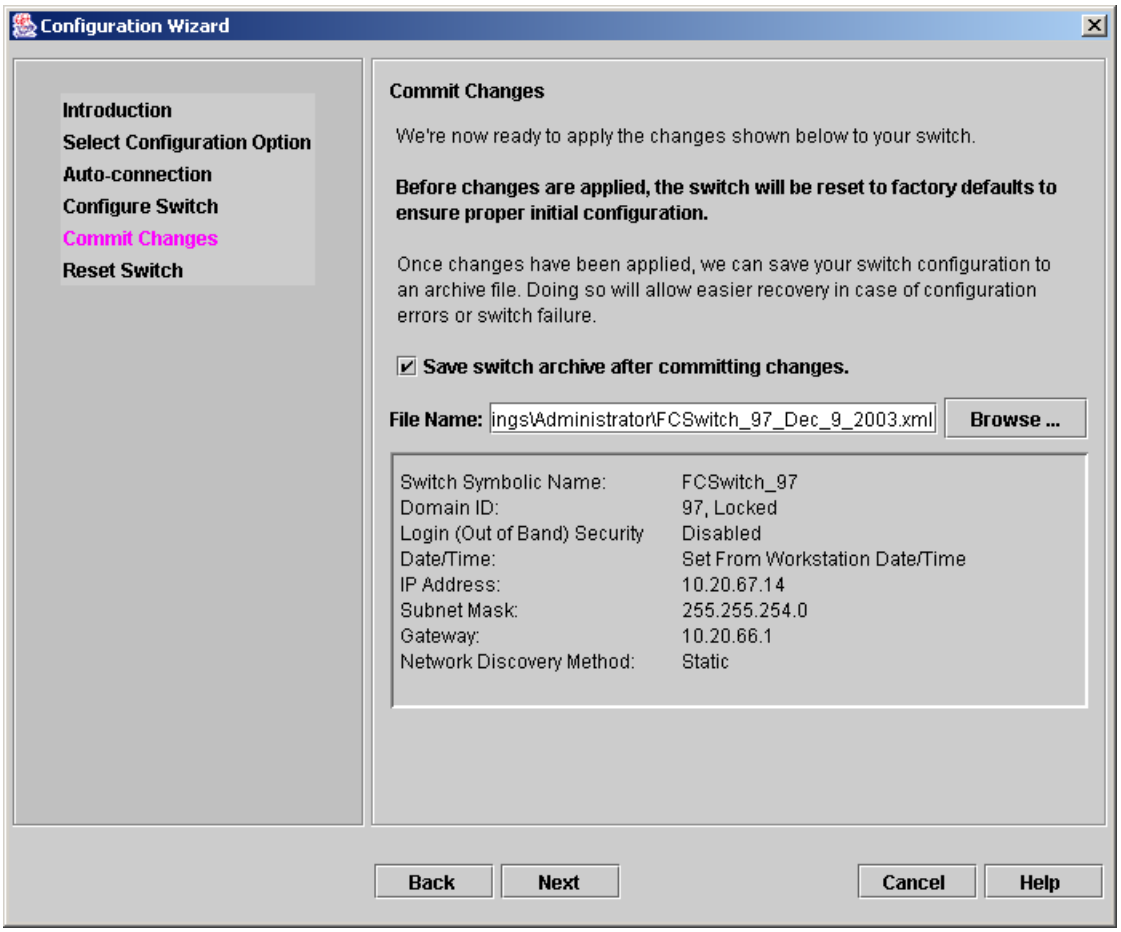
12. From the Switch Admin User Password window:
    a. Check **Enable user authentication** if you want to use this option. Otherwise, leave unchecked.
    b. Enter and confirm a **New Admin Password** if you are enabling user authentication. Otherwise, leave these fields blank.

c. Click **Next**.

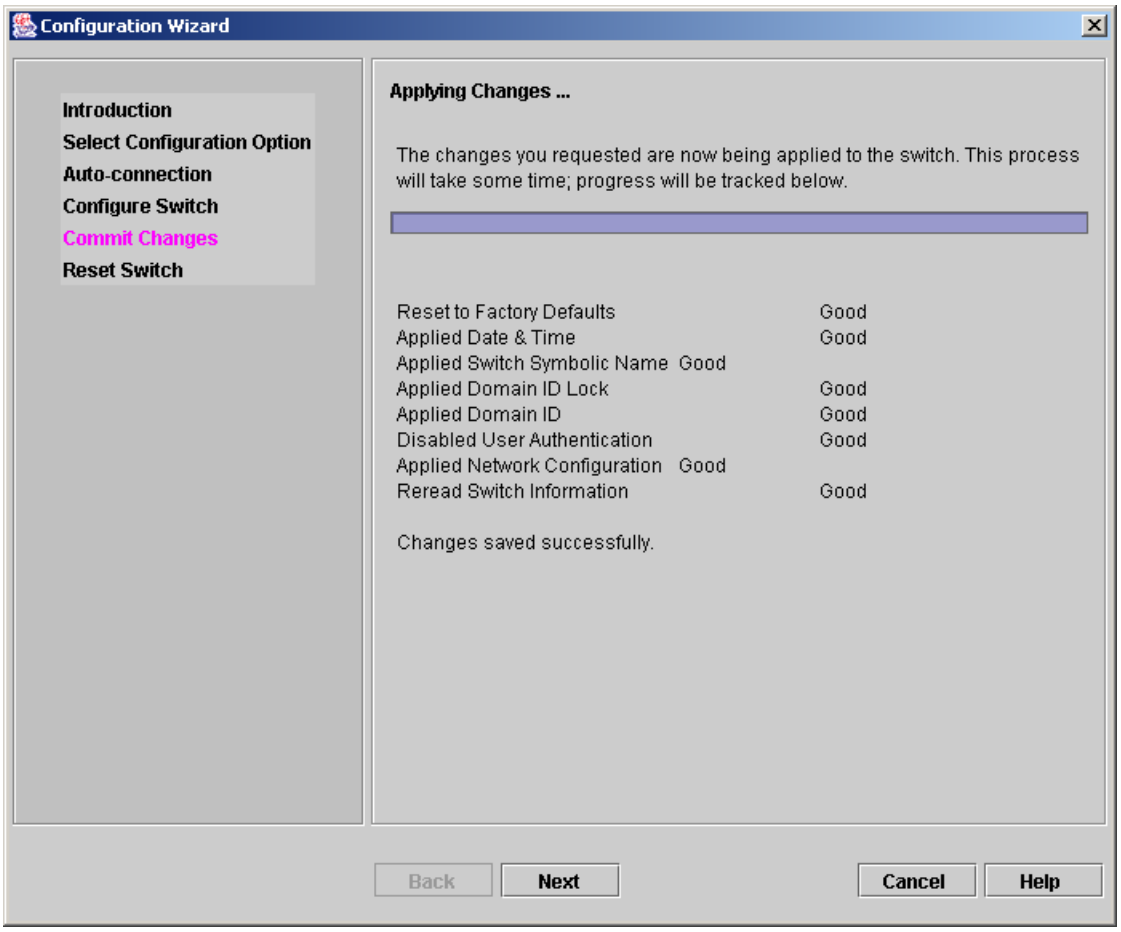

Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Switch Admin User Password
Setting a password for the default Admin user is an important step. As a basic security measure, it keeps your fabric from being easily compromised. We strongly urge you to enable user authentication and set your own password for the Admin user. This wizard also disallows reusing the default Admin password "password", for obvious reasons.
Enable User Authentication
New Admin Password (4-20 chars):
Confirm New Admin Password:
Back
Next
Cancel
Help

13. From the Commit Changes window:
    a. Review the configuration settings.
    b. Check **Save switch archive after committing changes** if you want to save the switch configuration archive file; then select the location and file name.

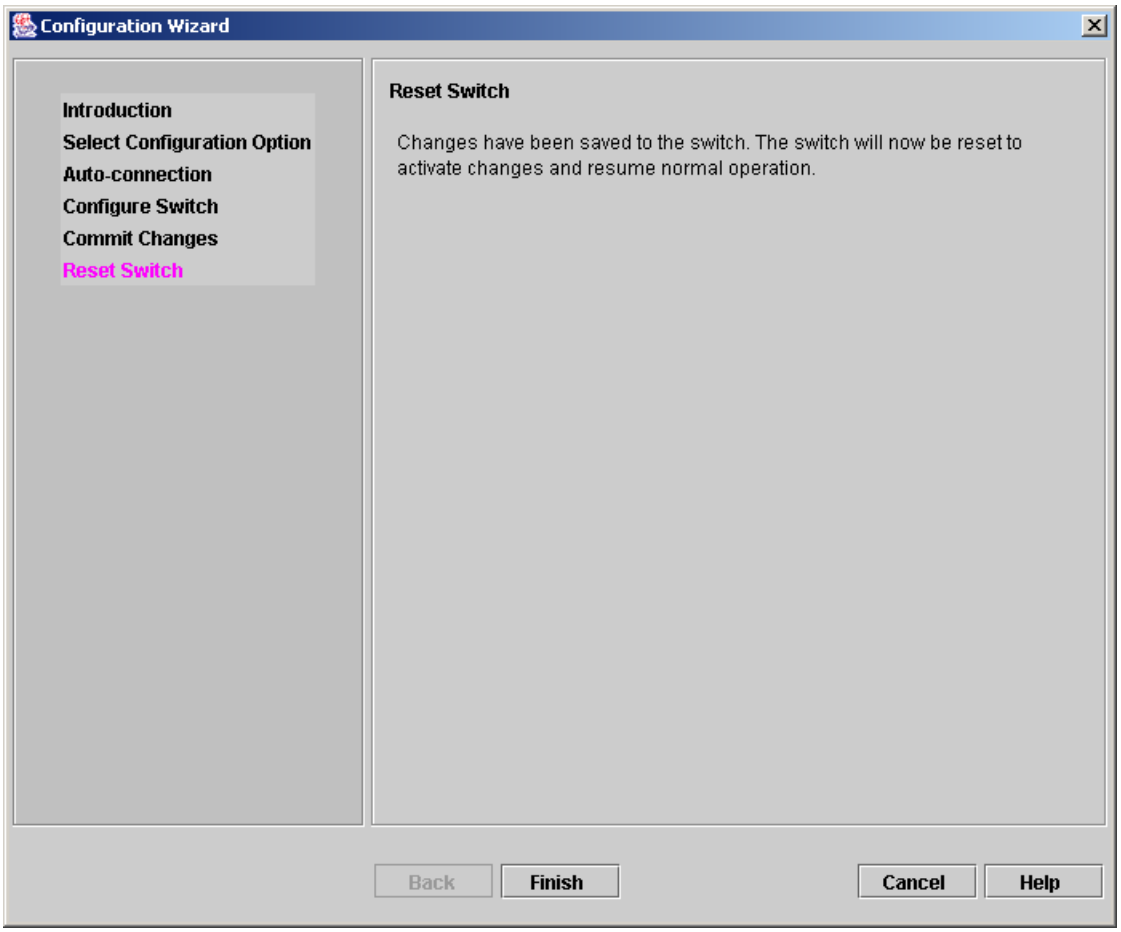
c. Click **Next**.


Configuration Wizard
Introduction
Select Configuration Option
Auto-connection
Configure Switch
Commit Changes
Reset Switch
Commit Changes
We're now ready to apply the changes shown below to your switch.
Before changes are applied, the switch will be reset to factory defaults to ensure proper initial configuration.
Once changes have been applied, we can save your switch configuration to an archive file. Doing so will allow easier recovery in case of configuration errors or switch failure.
Save switch archive after committing changes.
File Name: ings\Administrator\FCSwitch_97_Dec_9_2003.xml
Browse ...
Switch Symbolic Name: FCSwitch_97
Domain ID: 97, Locked
Login (Out of Band) Security Disabled
Date/Time: Set From Workstation Date/Time
IP Address: 10.20.67.14
Subnet Mask: 255.255.254.0
Gateway: 10.20.66.1
Network Discovery Method: Static
Back
Next
Cancel
Help

14. From the Apply Changes window:
    a. Verify that all changes were applied.
    b. Click **Next**.



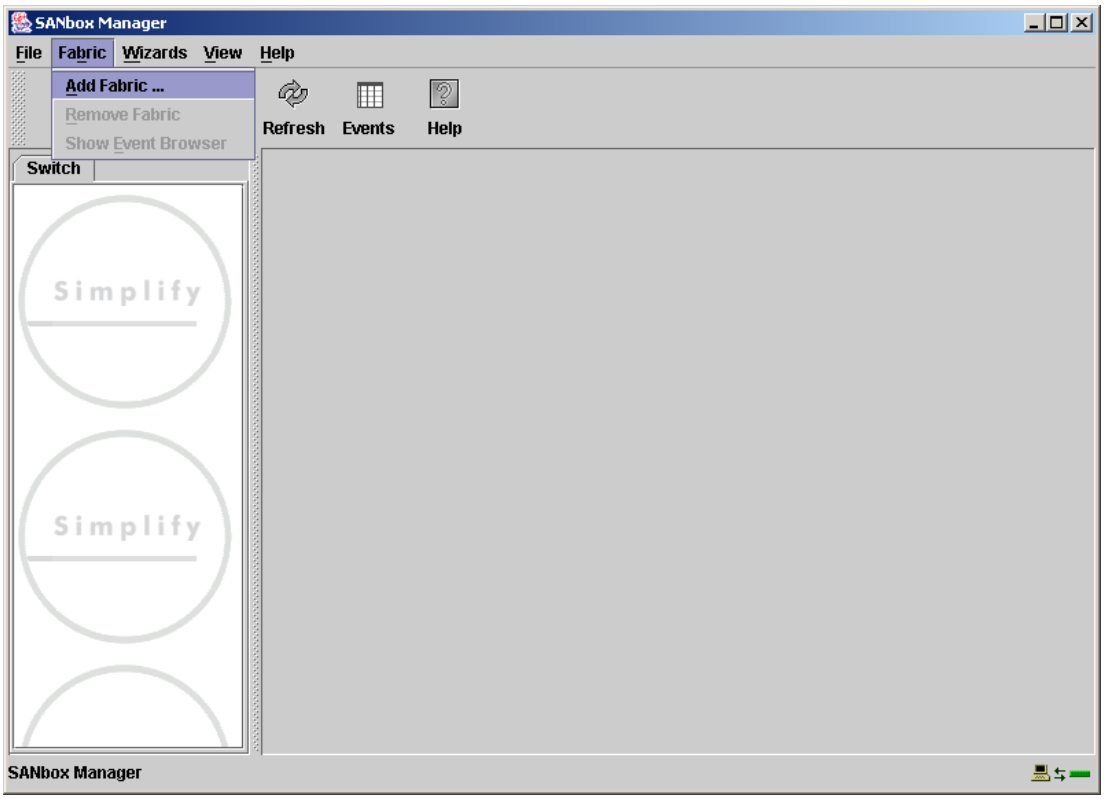
15. From the Reset Switch window, click **Finish** to complete the configuration.



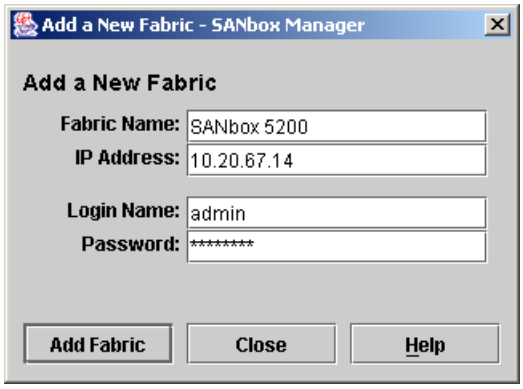
16. From the Finished window, click **Close**.

Configuring Port Properties

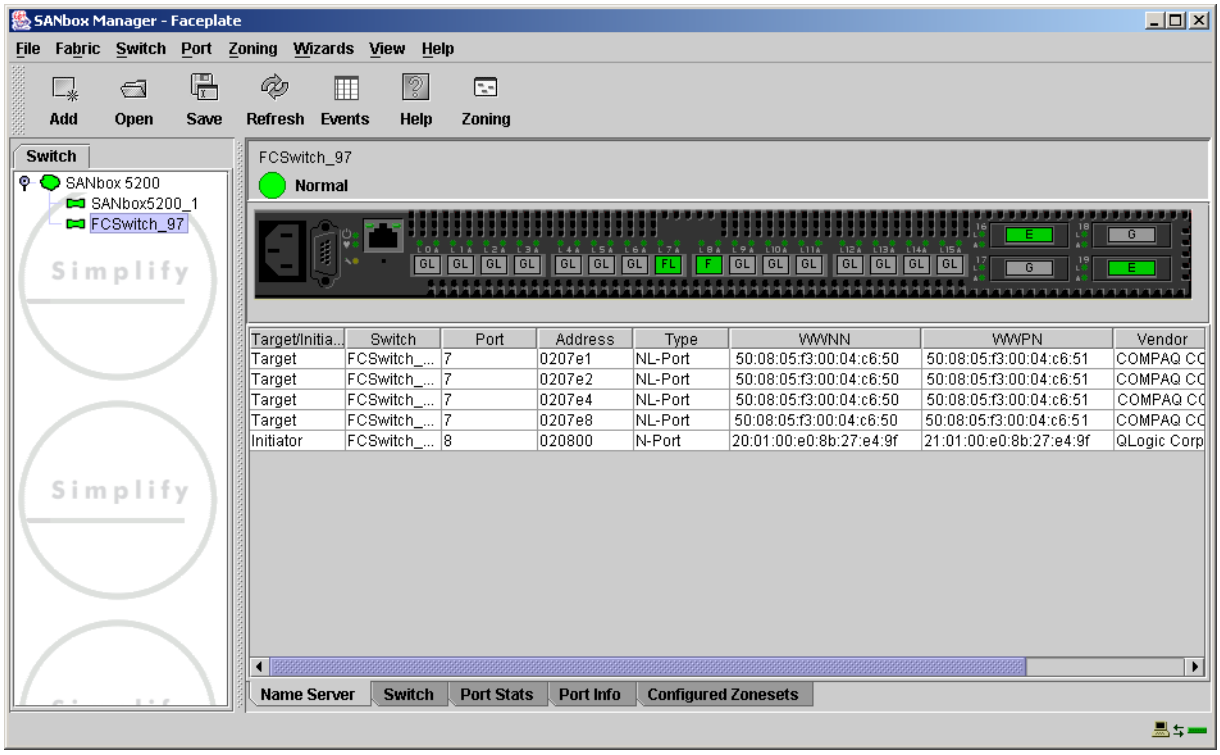
1. From the SANbox Manager, select **Add Fabric** from the Fabric menu:



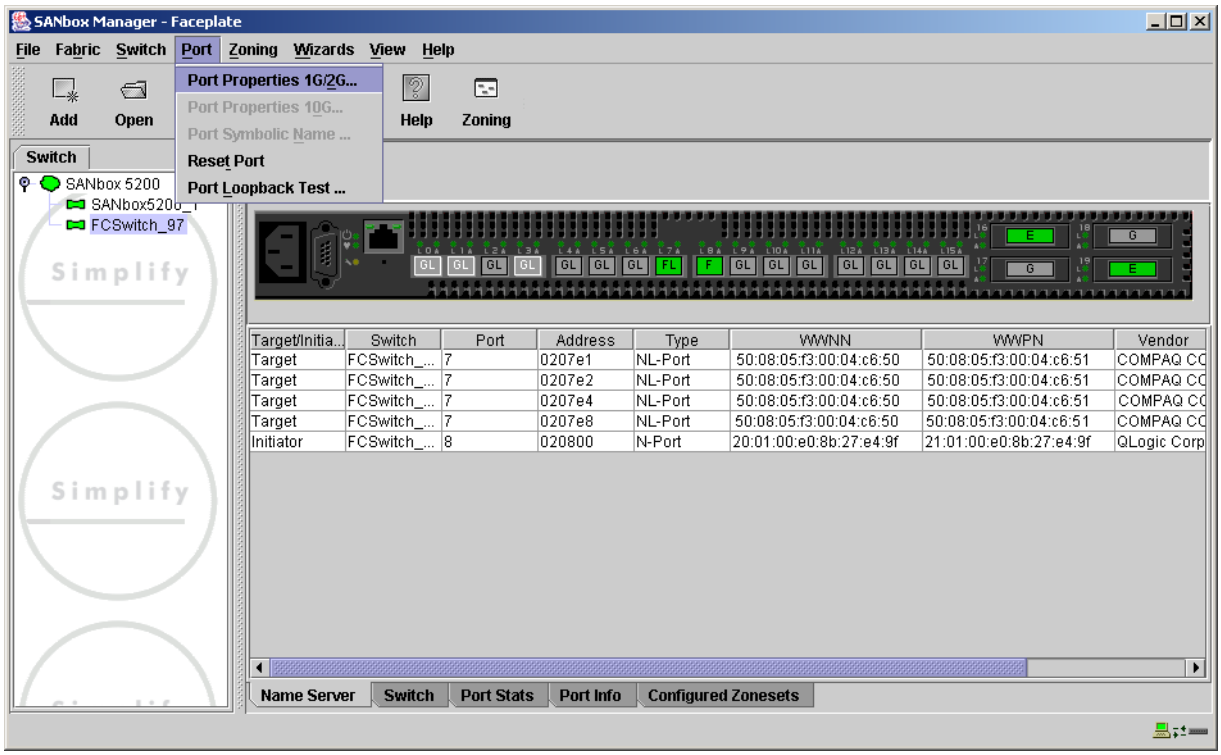
2. From the Add a New Fabric dialog:
   a. Enter a **Fabric Name**, **IP Address**, and **Login Name/Password** (if user authentication enabled).
   b. Click **Add Fabric**.



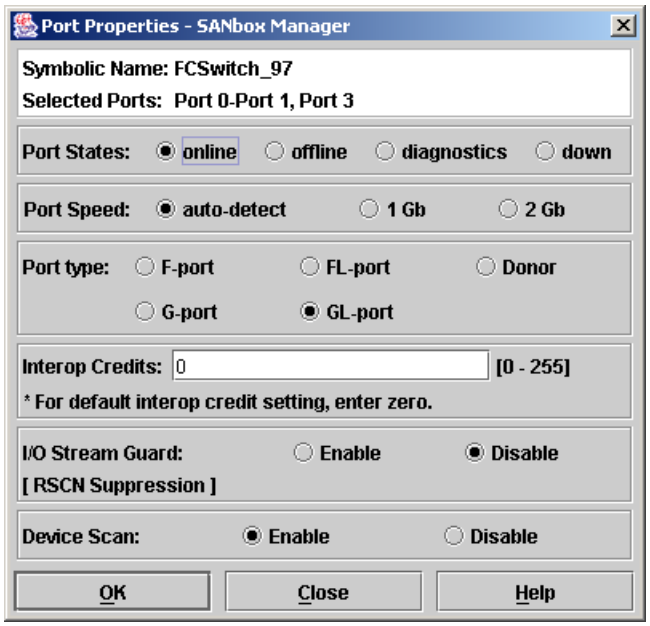
3. From the SANbox Manager – Faceplate dialog, expand the fabric and select the switch you wish to configure:


SANbox Manager - Faceplate
File Fabric Switch Port Zoning Wizards View Help
Add Open Save Refresh Events Help Zoning
Switch
SANbox 5200
SANbox5200_1
FCSwitch_97
FCSwitch_97
Normal
Target/Initia... Switch Port Address Type WWNN WWPN Vendor
Target FCSwitch_... 7 0207e1 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e2 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e4 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e8 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Initiator FCSwitch_... 8 020800 N-Port 20:01:00:e0:8b:27:e4:9f 21:01:00:e0:8b:27:e4:9f QLogic Corp
Name Server Switch Port Stats Port Info Configured Zonesets

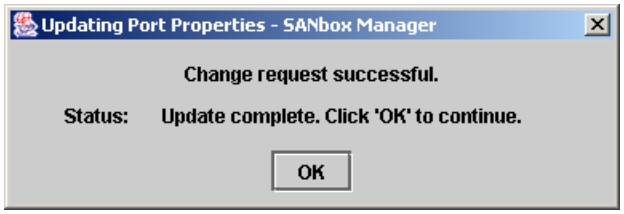
4. From the SANbox Manager – Faceplate dialog:
   a. Select one or more 1G/2G ports from the list.
   b. Select **Port Properties 1G/2G** from the Port menu.



5. From the Port Properties dialog:
   a. Select the desired port settings.
   b. Click **OK**.

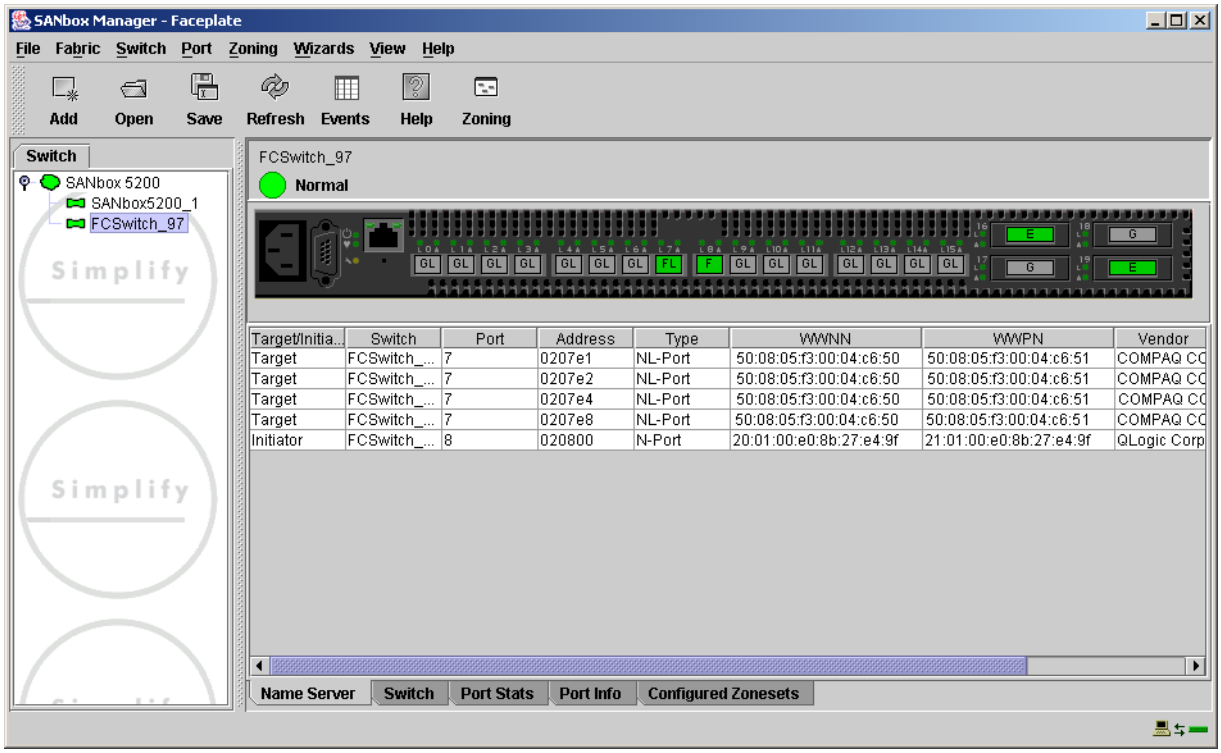

Port Properties - SANbox Manager
Symbolic Name: FCSwitch_97
Selected Ports: Port 0-Port 1, Port 3
Port States: online offline diagnostics down
Port Speed: auto-detect 1 Gb 2 Gb
Port type: F-port FL-port Donor
G-port GL-port
Interop Credits: 0 [0 - 255]
* For default interop credit setting, enter zero.
I/O Stream Guard: Enable Disable
[RSCN Suppression]
Device Scan: Enable Disable
OK
Close
Help

6. Click **OK** to close the Updating Port Properties message:



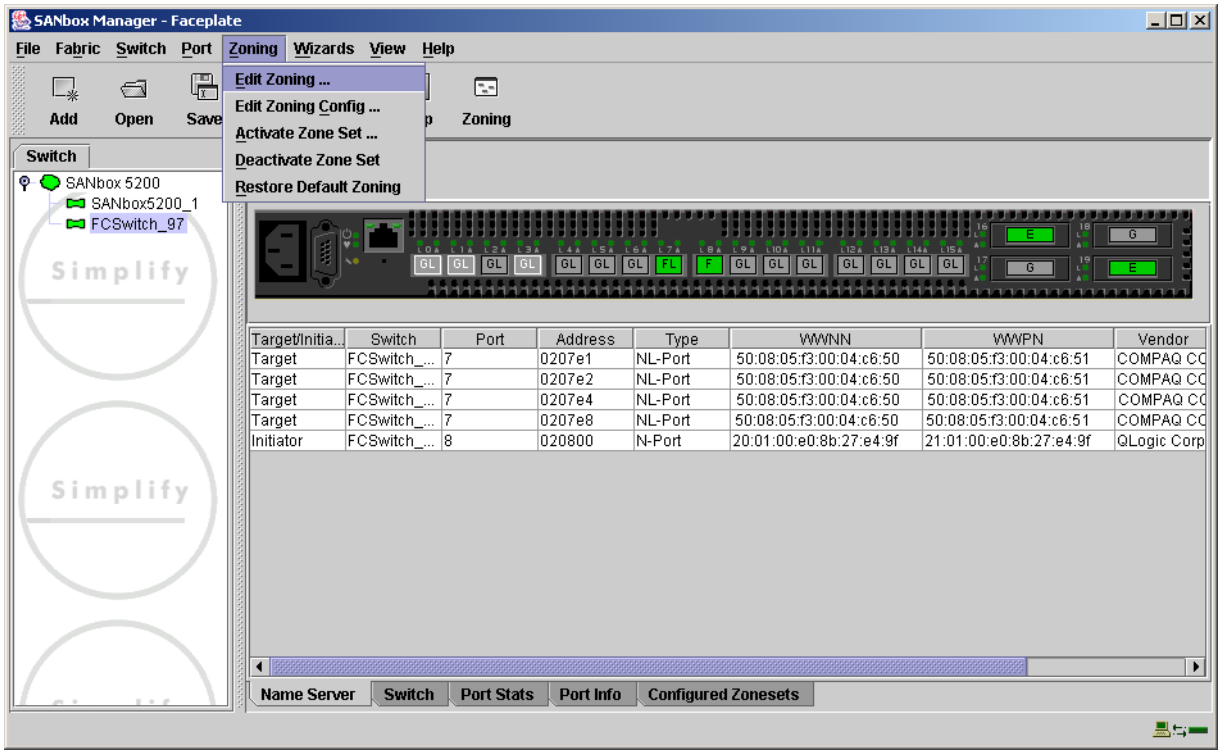
Connecting Cables

1. Connect the devices to the SANbox 5200 switch ports you configured.
2. Verify that the green Login LED is illuminated for each device.
3. Launch SANbox Manager and connect to the SANbox 5200.
4. From the SANbox Manager – Faceplate dialog, verify that all devices are listed in the Name Server.

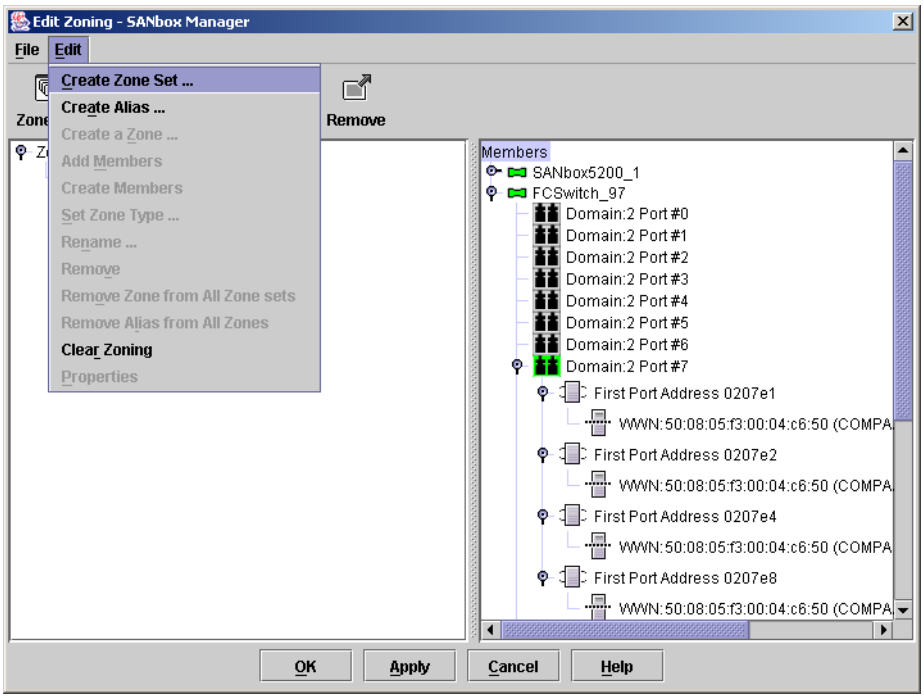

SANbox Manager - Faceplate
File Fabric Switch Port Zoning Wizards View Help
Add Open Save Refresh Events Help Zoning
Switch
SANbox 5200
SANbox5200_1
FCSwitch_97
FCSwitch_97
Normal
Target/Initia.. Switch Port Address Type WWNN WWPN Vendor
Target FCSwitch_... 7 0207e1 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e2 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e4 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e8 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Initiator FCSwitch_... 8 020800 N-Port 20:01:00:e0:8b:27:e4:9f 21:01:00:e0:8b:27:e4:9f QLogic Corp
Name Server Switch Port Stats Port Info Configured Zonesets

Configuring Zones

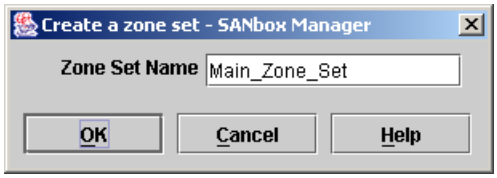
1. Launch the SANbox Manager and connect to the SANbox 5200.
2. From the SANbox Manager – Faceplate dialog, select **Edit Zoning** from the Zoning menu:


SANbox Manager - Faceplate
File Fabric Switch Port Zoning Wizards View Help
Edit Zoning ...
Edit Zoning Config ...
Activate Zone Set ...
Deactivate Zone Set
Restore Default Zoning
Add Open Save Zoning
Switch
SANbox 5200
SANbox5200_1
FCSwitch_97
Simplify
Target/Initia... Switch Port Address Type WWNN WWPN Vendor
Target FCSwitch_... 7 0207e1 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e2 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e4 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e8 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Initiator FCSwitch_... 8 020800 N-Port 20:01:00:e0:8b:27:e4:9f 21:01:00:e0:8b:27:e4:9f QLogic Corp
Name Server Switch Port Stats Port Info Configured Zonesets

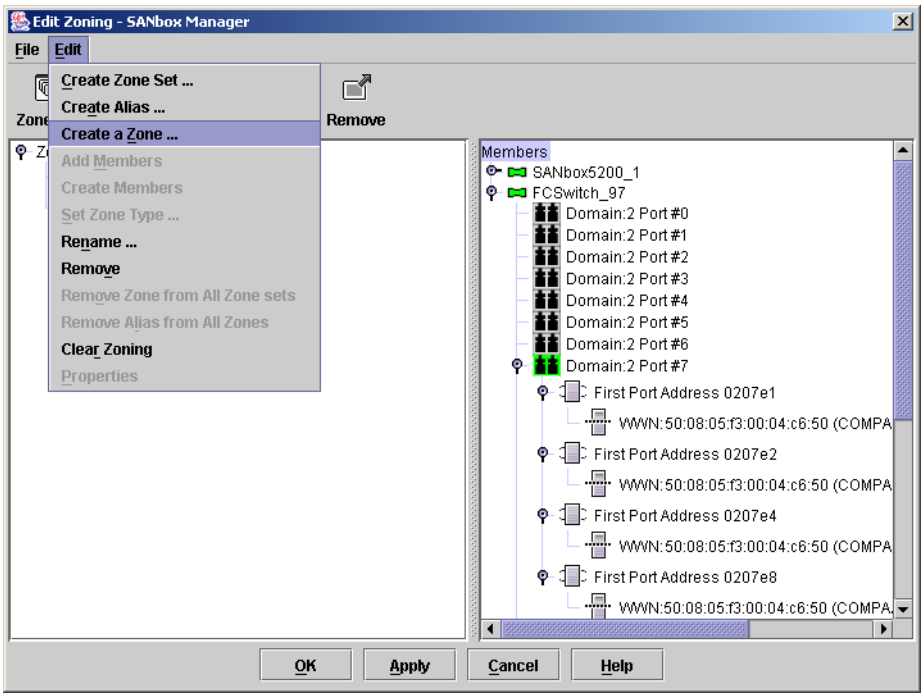
3. From the Edit Zoning dialog, select **Create Zone Set** from the Edit menu:



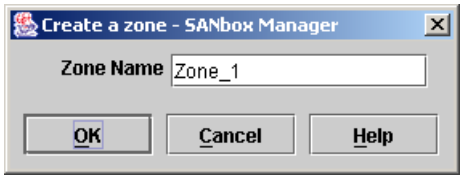
4. From the Create a zone set dialog:
   a. Enter a **Zone Set Name**.
   b. Click **OK**.



5. From the Edit Zoning dialog:
   a. Select the new zone set in the left frame.
   b. Select **Create a Zone** from the Edit menu.

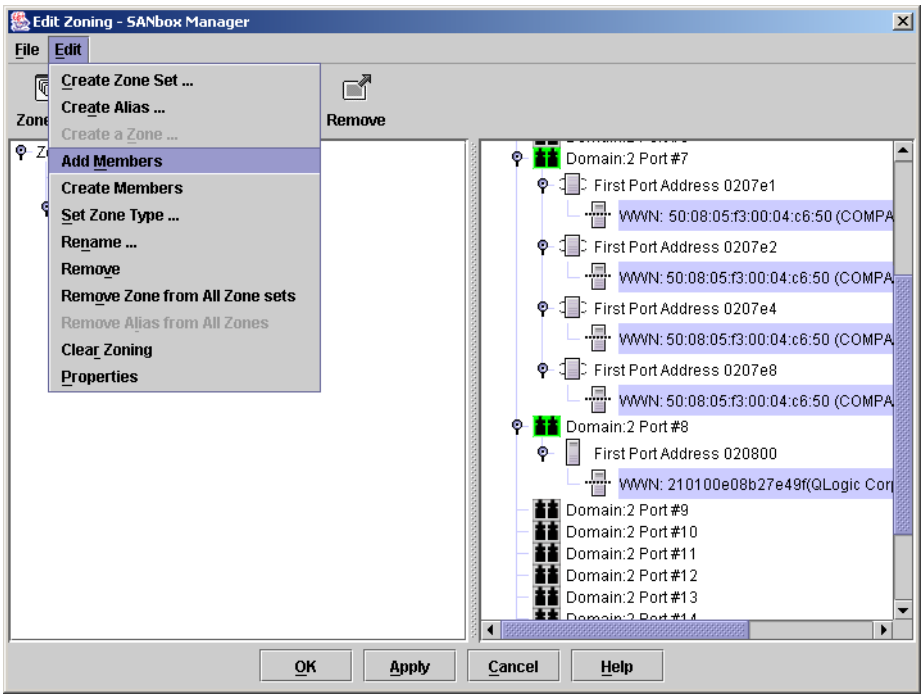


6. From the Create a zone dialog:
   a. Enter a **Zone Name**.
   b. Click **OK**.



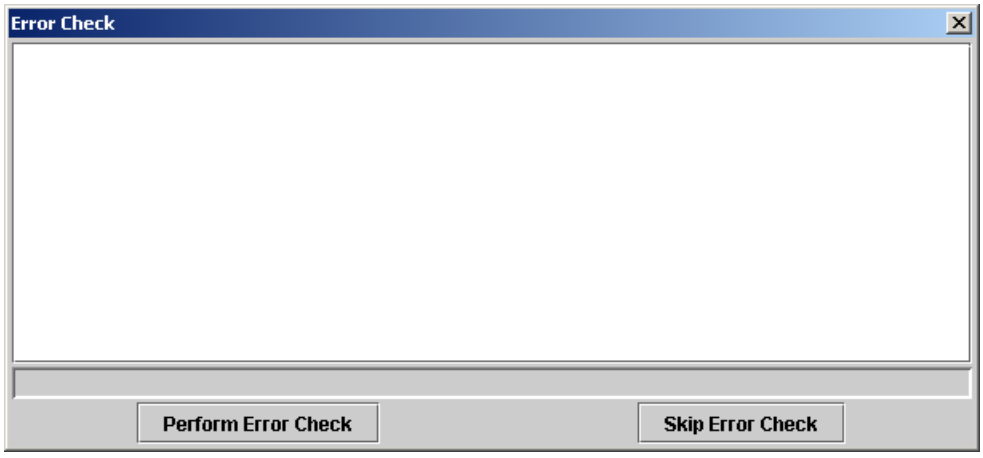
7. From the Edit Zoning dialog:
   a. Expand the zone set and select the zone in the left frame.
   b. Highlight the devices to add in the right frame.
   c. Select **Add Members** from the Edit menu.

d. Click **OK**.

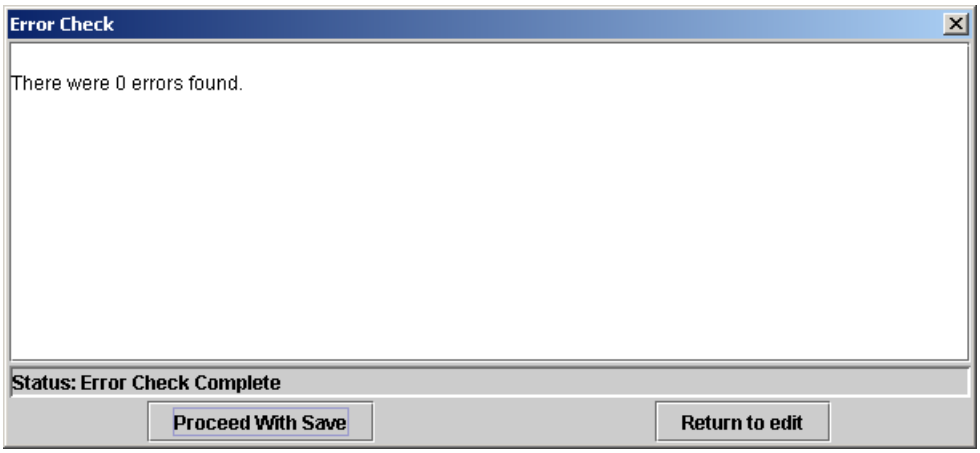


8. From the Error Check dialog:

a. Click **Perform Error Check**.



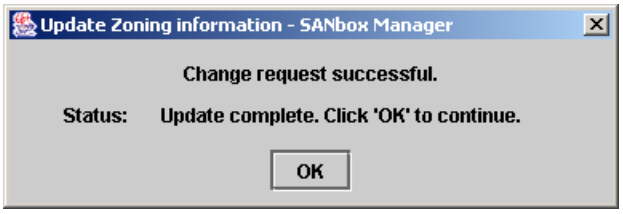
b. Verify that there were no errors reported:



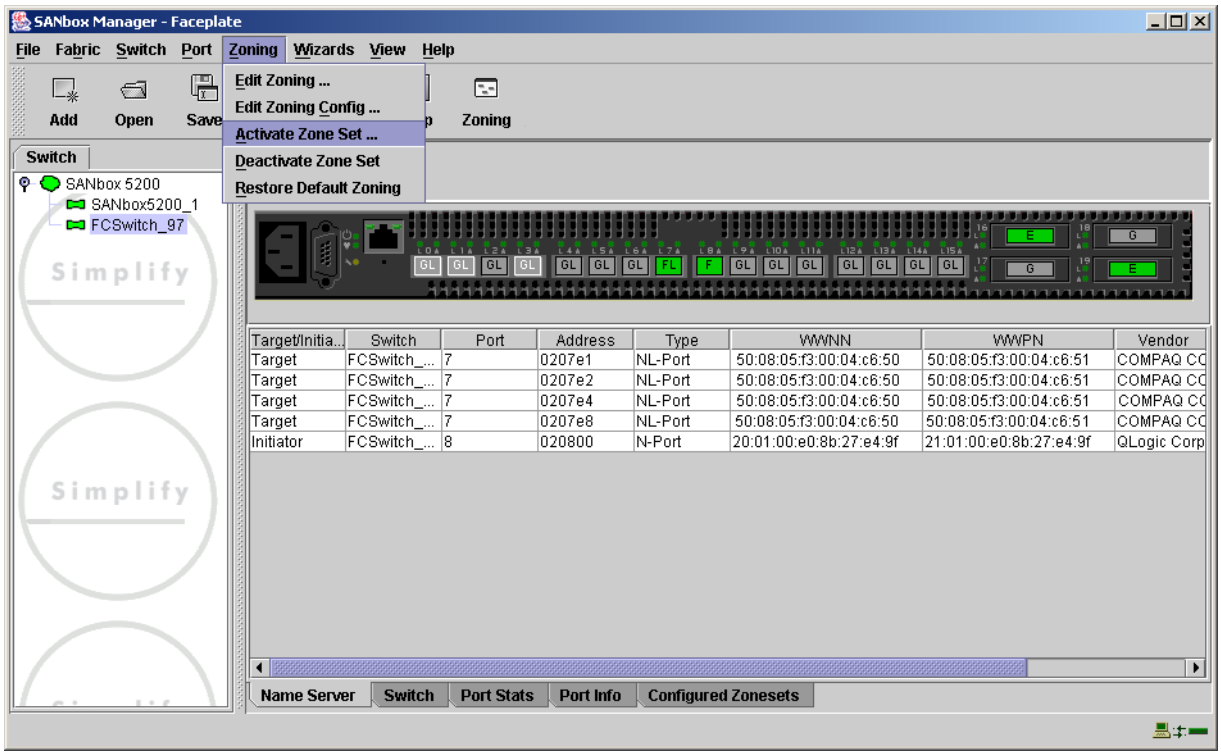
c. Click **Proceed with Save**.

9. Click **OK** to close the Zoning data confiirmation message:

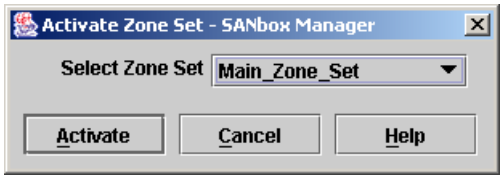
10. Click **OK** to close the Update Zoning information message:



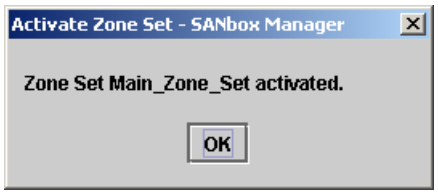
11. From the SANbox Manager – Faceplate dialog, select **Activate Zone Set** from the Zoning menu:


SANbox Manager - Faceplate
File Fabric Switch Port Zoning Wizards View Help
Edit Zoning ...
Edit Zoning Config ...
Activate Zone Set ...
Deactivate Zone Set
Restore Default Zoning
Add Open Save Zoning
Switch
SANbox 5200
SANbox5200_1
FCSwitch_97
Simplify
Target/Initia... Switch Port Address Type WWNN WWPN Vendor
Target FCSwitch_... 7 0207e1 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e2 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e4 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Target FCSwitch_... 7 0207e8 NL-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
Initiator FCSwitch_... 8 020800 N-Port 20:01:00:e0:8b:27:e4:9f 21:01:00:e0:8b:27:e4:9f QLogic Corp
Name Server Switch Port Stats Port Info Configured Zonesets

12. From the Activate Zone Set dialog:
    a. Select the Zone Set to activate from the list.
    b. Click **Activate**.



13. Click **OK** to close the Activate Zone Set confirmation message:



SANbox2 Configuration

The following procedures explain how to configure the SANbox2 switch, verify the connections and test your configuration:

- Configuring the Switch
- Connecting Cables
- Configuring Zones

The SANbox2-64 was tested in both standalone and cascade environments.

If your SAN configuration uses a multi-vendor environment, see the *QLogic Switch Interoperability Guide* located at http://www.qlogic.com/interopguide for configuration procedures.

Configuring the Switch

The following procedures explain how to configure the SANbox2 switch:

- Configuring Serial Ports
- Assigning IP Address
- Configuring Port Properties
- Setting up HBA Persistent Binding

Configuring Serial Ports

1. Connect a DB9 (female) Null modem cable to the switch.
2. Launch a serial communication application and configure it with the following settings:
   - **BAUD Rate**: 9600
   - **Data Bits**: 8
   - **Parity:** None
   - **Stop Bits**: 1
   - **Flow Control**: None

Assigning IP Address

Using the Command Line Interface (CLI):

1. Login to the switch. (username: **admin**, Password: **password**)
2. Start the administrator mode:

```
SANbox2 #> admin start
```

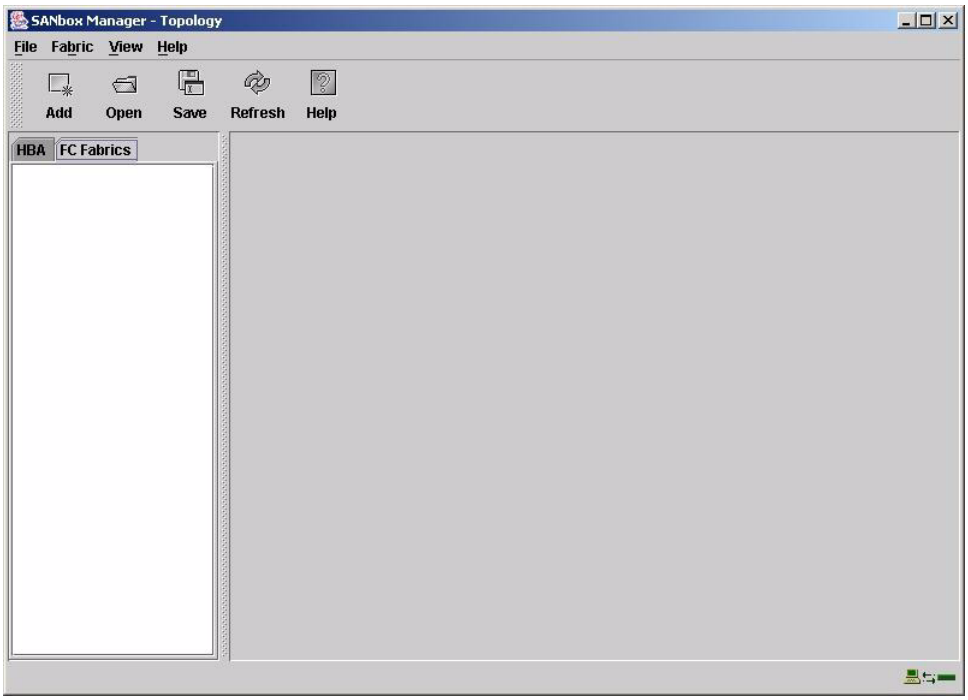
3. Start the switch setup program to configure the IP address.

```
SANbox2 (Admin) #> set setup system
Eth0NetworkAddress        (dot-notated IP Address)          [10. 0.0.1] <IP Address>
Eth0NetworkMask           (dot-notated IP Address)           [255.0.0.0] <Net Mask>
```

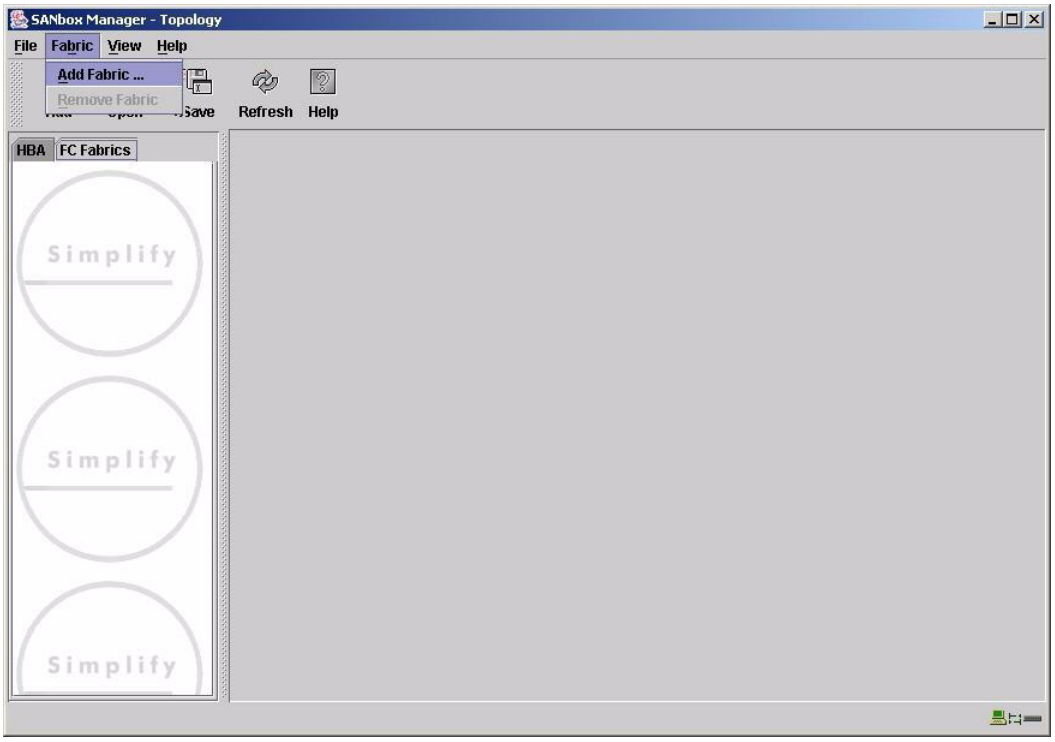
```
Eth0GatewayAddress          (dot-notated IP Address)              [10.0.0.1] <Gateway>
Eth0NetworkDiscovery        (1=Static, 2=Bootp, 3=Dhcp, 4=Rarp)   [Static]
AdminTimeout                (dec value 0-1440 minutes, 0=never)   [30]
TempMonitoringWarning       (dec value 0-100 degrees Celsius)     [65]
TempMonitoringFailure       (dec value 0-100 degrees Celsius)     [70]
TempFailurePortShutdown     (True / False)                        [False]
SecurityEnabled             (True / False)                        [False]
LocalLogEnabled             (True / False)                        [True]
RemoteLogEnabled            (True / False)                        [False]
RemoteLogHostAddress        (dot-notated IP Address)              [10.0.0.254]

Do you want to save and activate this system setup? (y/n): [n] y

System setup saved and activated.
```

Configuring Port Properties

1. Launch SANbox Manager.
2. From the main window, click the **FC Fabric** tab:

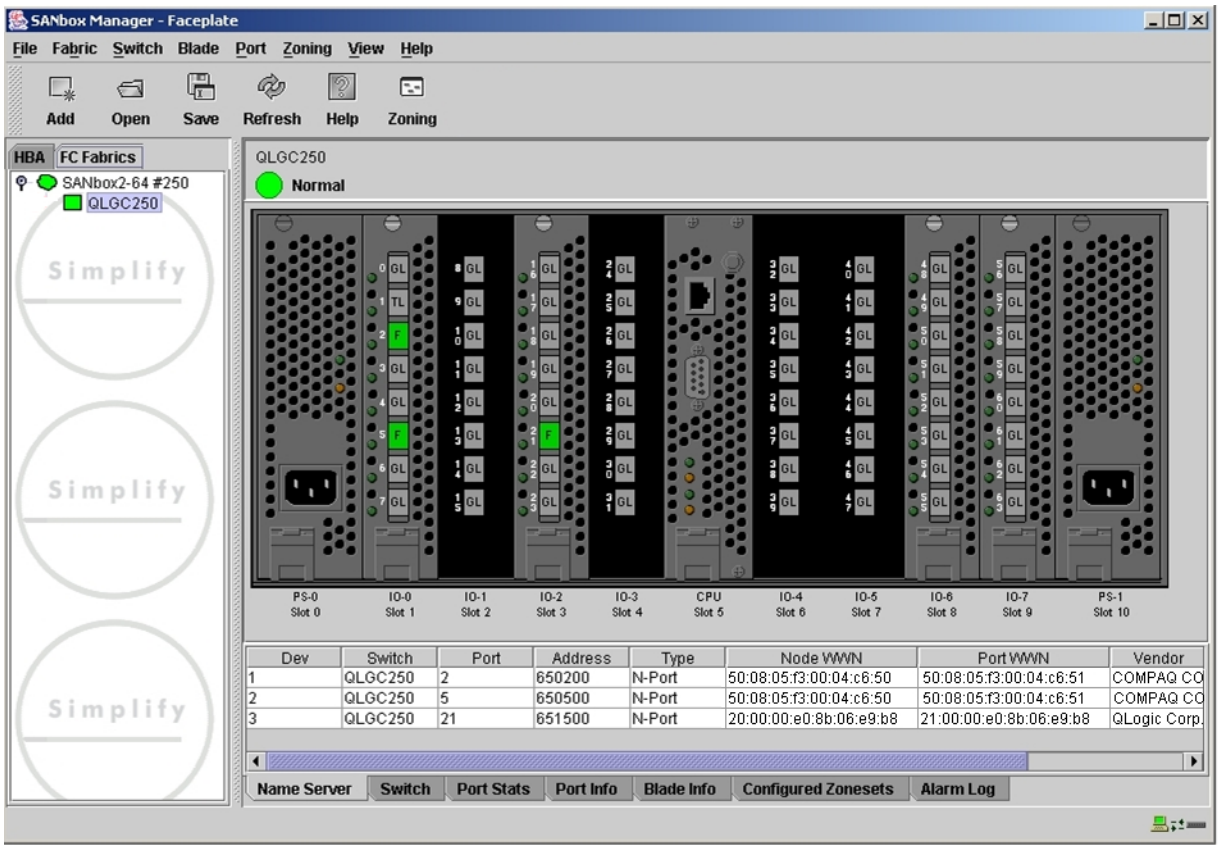


3. Select **Add Fabric** from the **Fabric** menu:

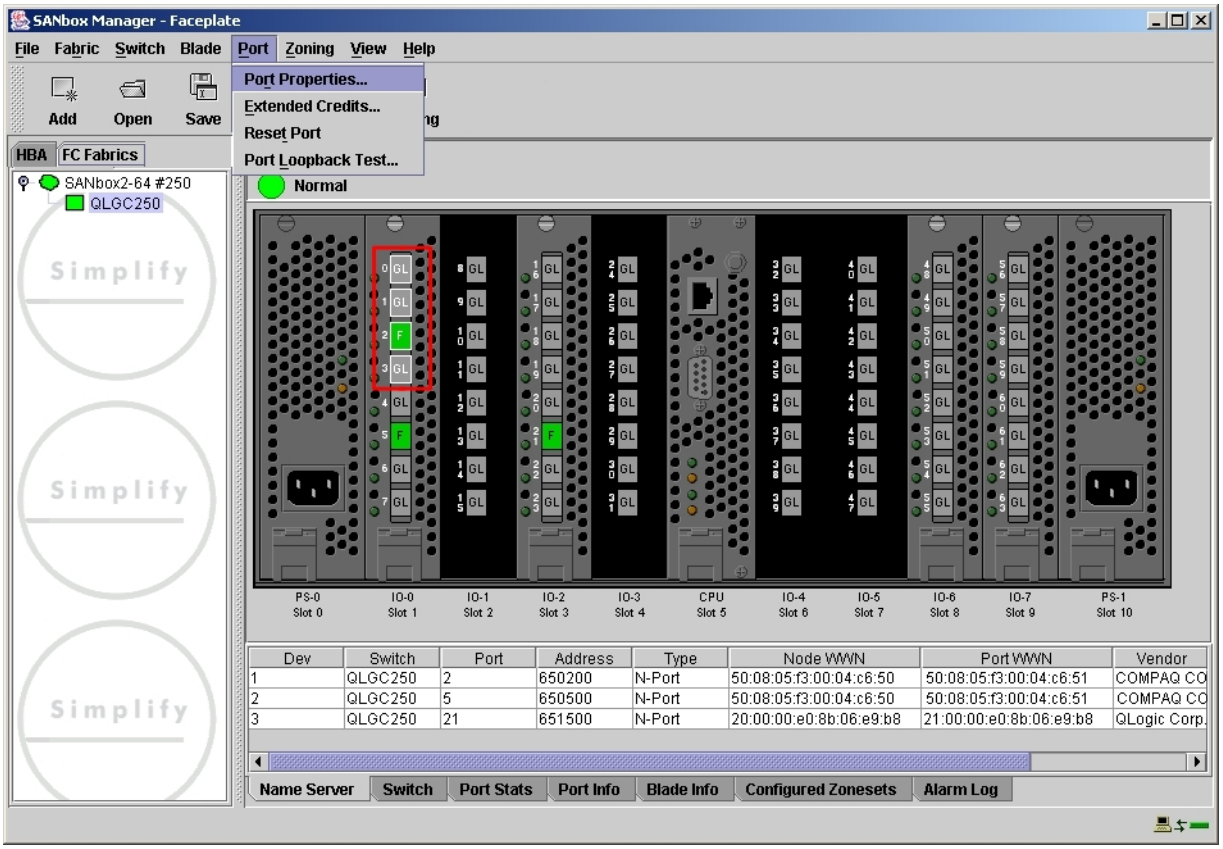


4. Enter a **Fabric View Name** and the **IP Address** of the switch; click **Add Fabric**:

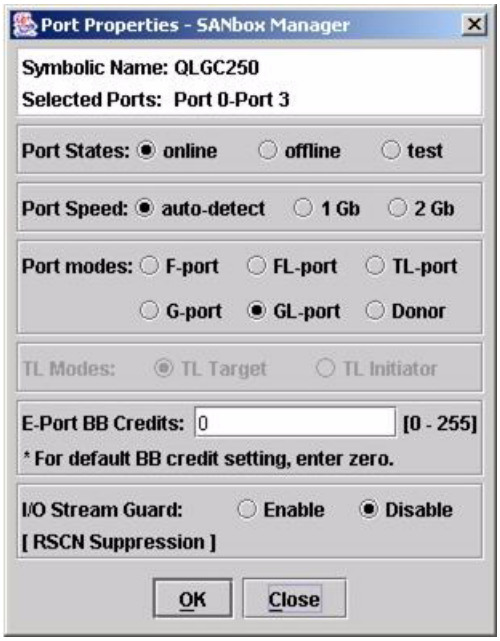
5. Expand the **Fabric** in the left frame and select the switch you wish to configure:


SANbox Manager - Faceplate
File Fabric Switch Blade Port Zoning View Help
Add Open Save Refresh Help Zoning
HBA FC Fabrics
SANbox2-64 #250
QLGC250
QLGC250
Normal
PS-0 Slot 0
IO-0 Slot 1
IO-1 Slot 2
IO-2 Slot 3
IO-3 Slot 4
CPU Slot 5
IO-4 Slot 6
IO-5 Slot 7
IO-6 Slot 8
IO-7 Slot 9
PS-1 Slot 10
Dev Switch Port Address Type Node WWN Port WWN Vendor
1 QLGC250 2 650200 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
2 QLGC250 5 650500 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
3 QLGC250 21 651500 N-Port 20:00:00:e0:8b:06:e9:b8 21:00:00:e0:8b:06:e9:b8 QLogic Corp.
Name Server Switch Port Stats Port Info Blade Info Configured Zonesets Alarm Log

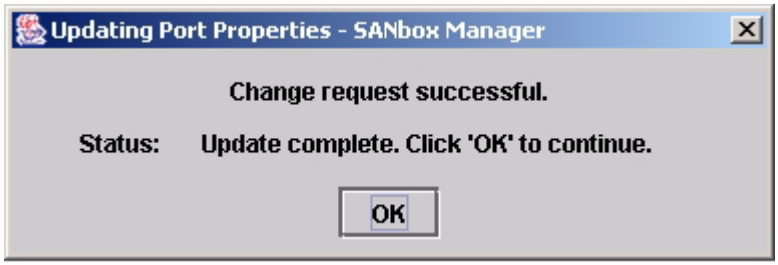
6. From the SANbox Manager – Faceplate dialog:
   a. Select a single port or using the Ctrl/Shift key select a number of ports.
   b. Select **Port Properties** from the **Port** menu.


SANbox Manager - Faceplate
File Fabric Switch Blade Port Zoning View Help
Port Properties...
Extended Credits...
Reset Port
Port Loopback Test...
Add Open Save
HBA FC Fabrics
SANbox2-64 #250
QLGC250
Normal
PS-0 Slot 0
IO-0 Slot 1
IO-1 Slot 2
IO-2 Slot 3
IO-3 Slot 4
CPU Slot 5
IO-4 Slot 6
IO-5 Slot 7
IO-6 Slot 8
IO-7 Slot 9
PS-1 Slot 10
Dev Switch Port Address Type Node WWN Port WWN Vendor
1 QLGC250 2 650200 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
2 QLGC250 5 650500 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
3 QLGC250 21 651500 N-Port 20:00:00:e0:8b:06:e9:b8 21:00:00:e0:8b:06:e9:b8 QLogic Corp.
Name Server Switch Port Stats Port Info Blade Info Configured Zonesets Alarm Log

7. From the Port Properties dialog, select the **Port Speed** and **Port Mode** for the selected port(s):


Port Properties - SANbox Manager
Symbolic Name: QLGC250
Selected Ports: Port 0-Port 3
Port States: online offline test
Port Speed: auto-detect 1 Gb 2 Gb
Port modes: F-port FL-port TL-port
G-port GL-port Donor
TL Modes: TL Target TL Initiator
E-Port BB Credits: 0 [0 - 255]
* For default BB credit setting, enter zero.
I/O Stream Guard: Enable Disable
[RSCN Suppression]
OK
Close

8. Click **OK** to close the status message:



Setting up HBA Persistent Binding

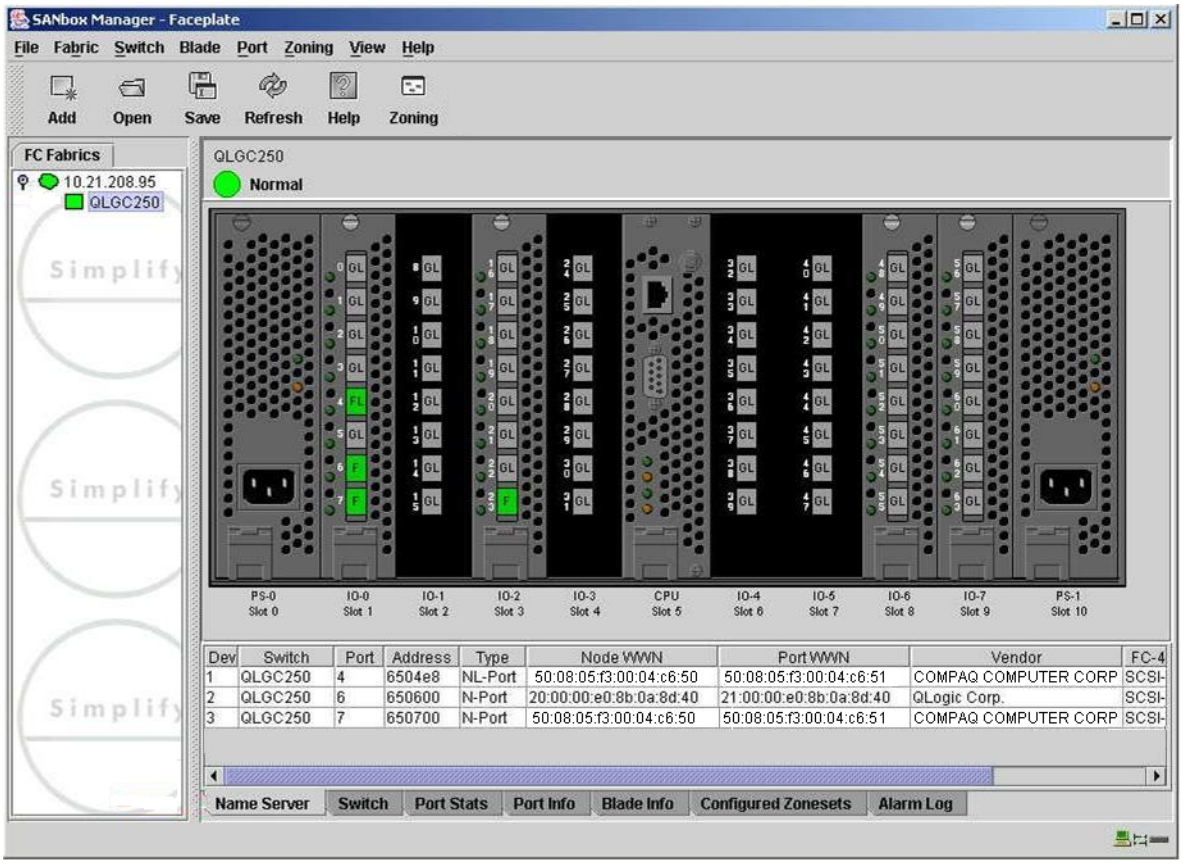
Persistent binding is an optional setup step to ensure that devices will be identified in a consistent fashion to the Operating System each time a device is discovered. For example, a device with WWN 50:05:0d:80:00:00:50:72 is detected by the Operating System as controller 2, target 2, LUN 0. Settings should also remain consistent after each reboot of the server.

Please see http://www.qlogic.com/support/home_resources.asp?id=76 for more information on persistent binding.

NOTE: Persistent binding is an optional step that must be completed after configuration of all SAN devices.

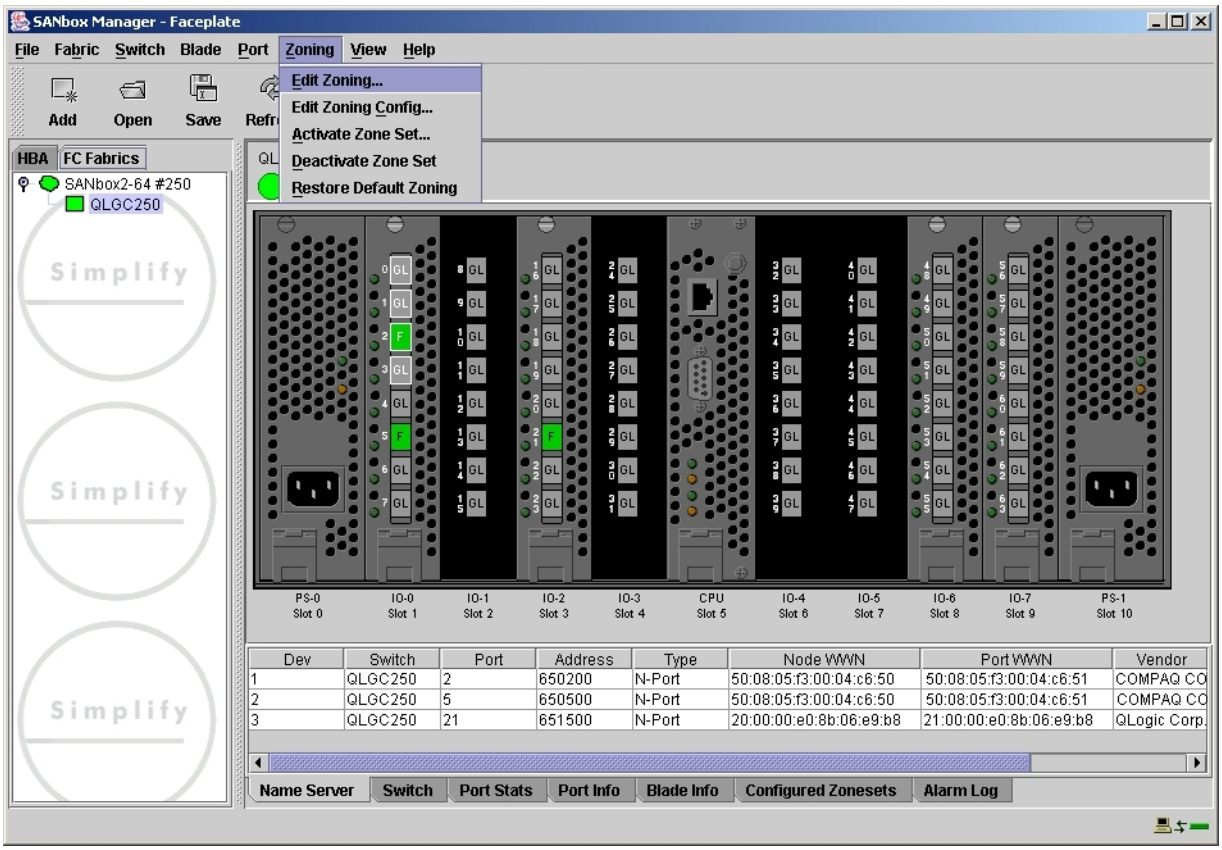
Connecting Cables

1. Connect the devices to the switch ports you have already configured.
2. Verify that the green Login LED is illuminated for each device.
3. Launch the SANsurfer Manager and connect to the SANbox2-64.
4. From the SANbox Manager-Faceplate dialog:
   a. Select the **Name Server** tab in the lower right frame.
   b. Verify that all devices are listed.

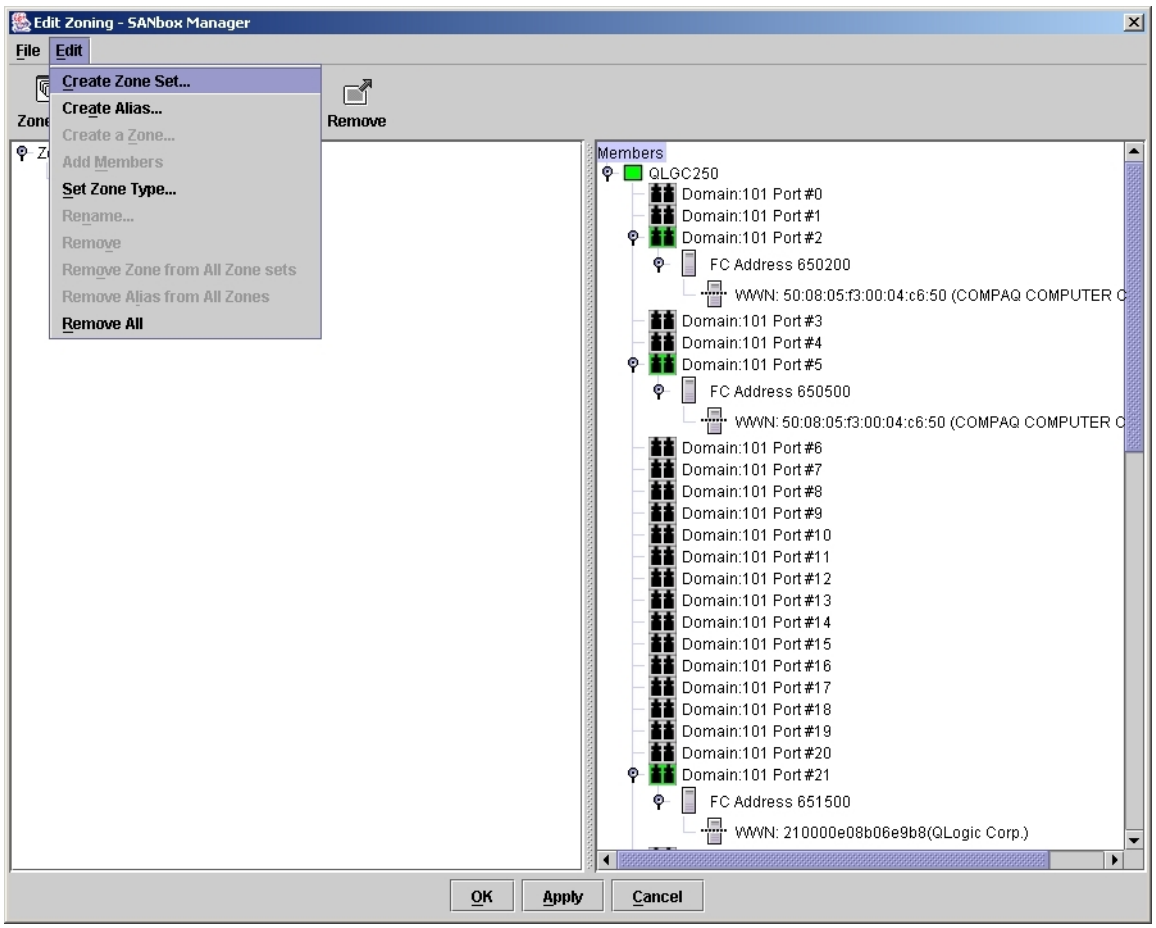


Configuring Zones

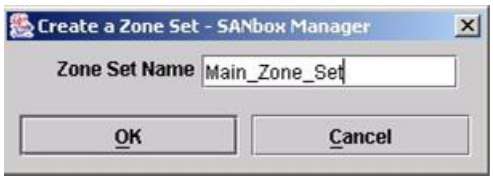
1. In the SANbox Manager – Faceplate dialog, select **Edit Zoning…** from the **Zoning** menu:


SANbox Manager - Faceplate
File Fabric Switch Blade Port Zoning View Help
Edit Zoning...
Edit Zoning Config...
Activate Zone Set...
Deactivate Zone Set
Restore Default Zoning
Add Open Save
HBA FC Fabrics
SANbox2-64 #250
QLGC250
Simplify
PS-0 Slot 0
IO-0 Slot 1
IO-1 Slot 2
IO-2 Slot 3
IO-3 Slot 4
CPU Slot 5
IO-4 Slot 6
IO-5 Slot 7
IO-6 Slot 8
IO-7 Slot 9
PS-1 Slot 10
Dev Switch Port Address Type Node WWN Port WWN Vendor
1 QLGC250 2 650200 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
2 QLGC250 5 650500 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
3 QLGC250 21 651500 N-Port 20:00:00:e0:8b:06:e9:b8 21:00:00:e0:8b:06:e9:b8 QLogic Corp.
Name Server Switch Port Stats Port Info Blade Info Configured Zonesets Alarm Log

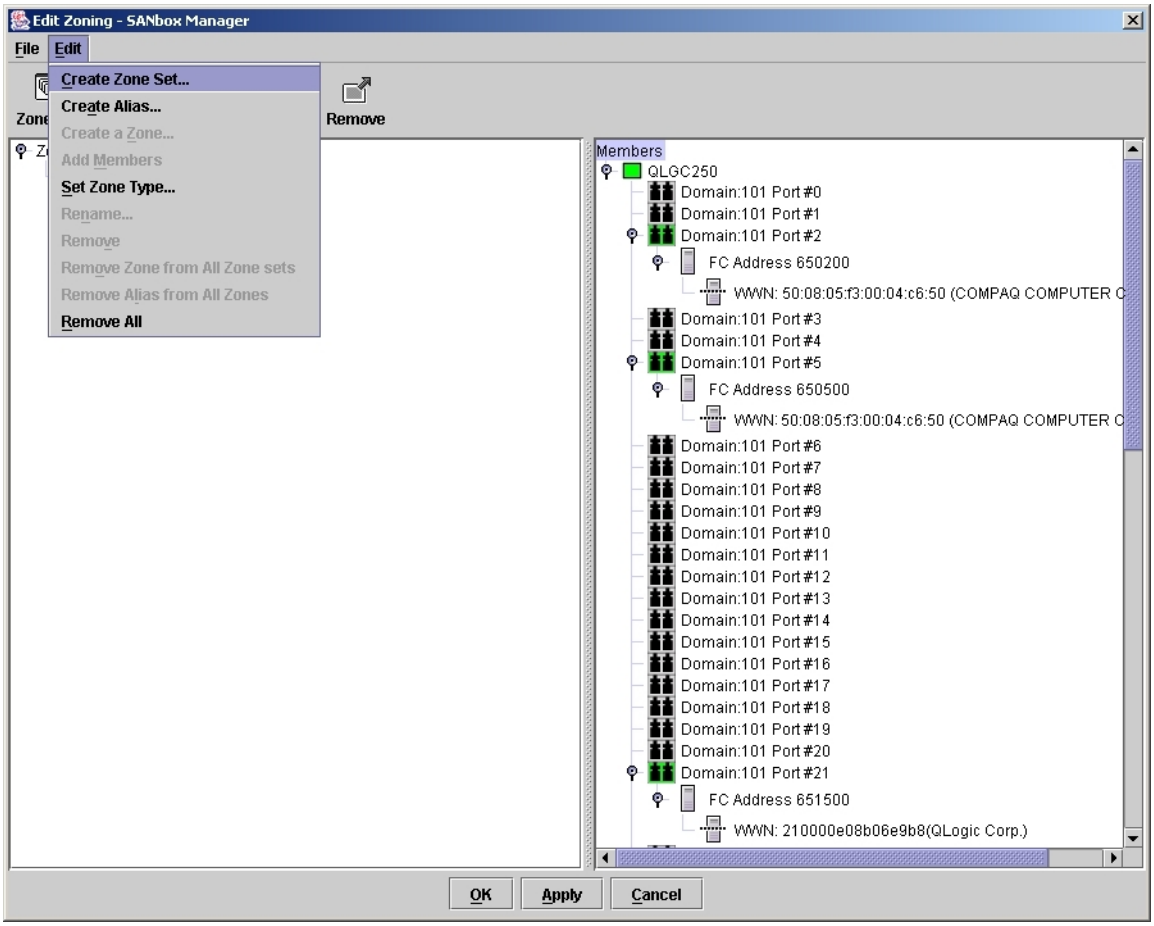
2. In the Edit Zoning dialog, select **Create Zone Set** from the **Edit** menu:



3. From the Create a Zone Set dialog, enter the name of the zone set and click **OK**:



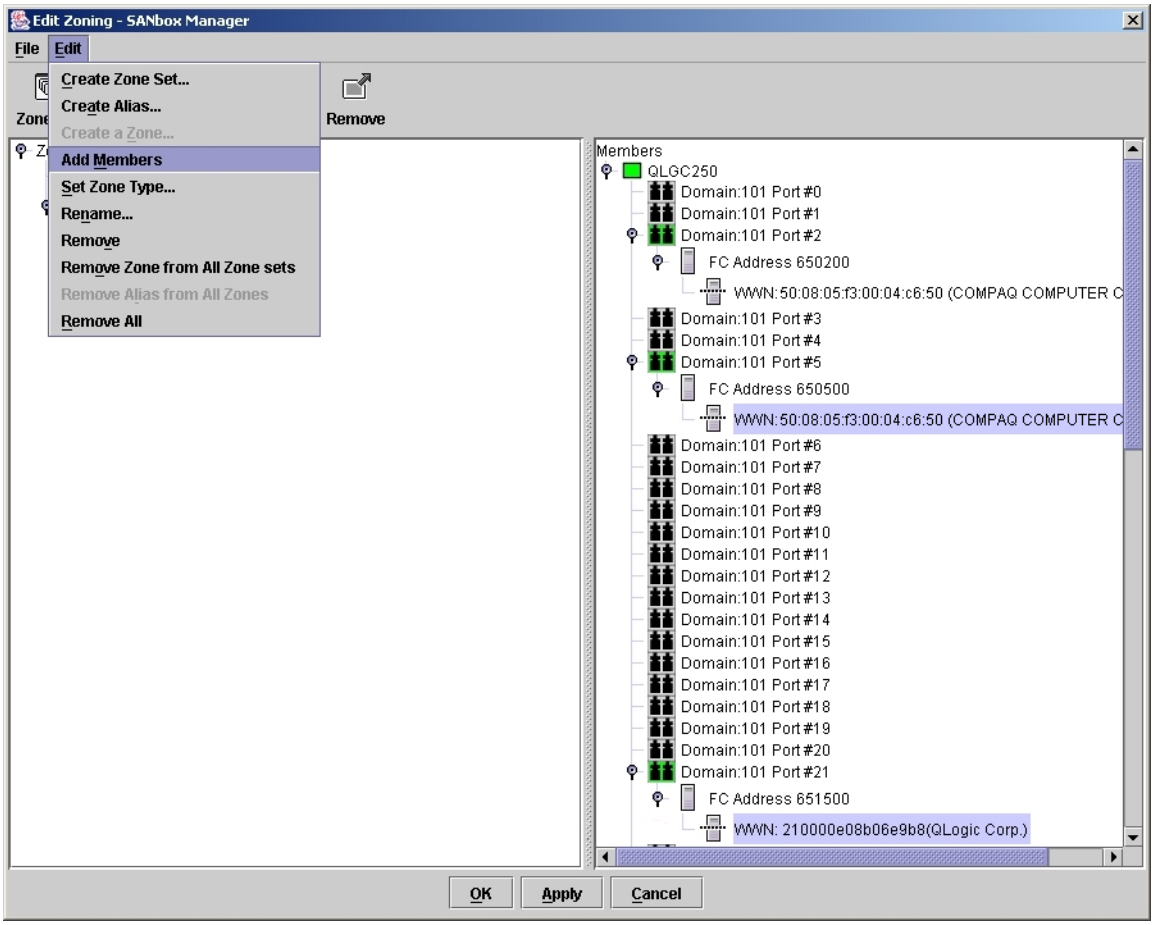
4. From the Edit Zoning dialog, click on the new zone set and select **Create a Zone…** from the **Edit** menu.



5. From the Create Zone dialog:
   a. Click on the new zone.
   b. Select the devices from the right frame.

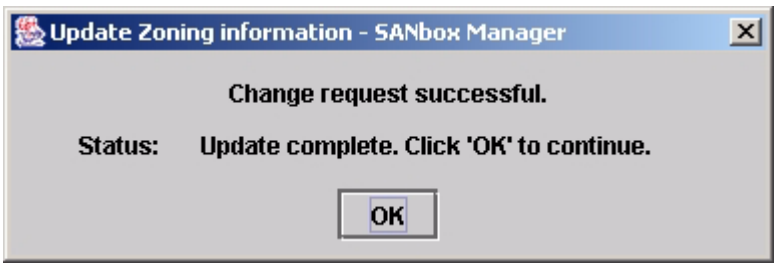
c. Select **Add Members** from the **Edit** menu.

d. Click **OK**.

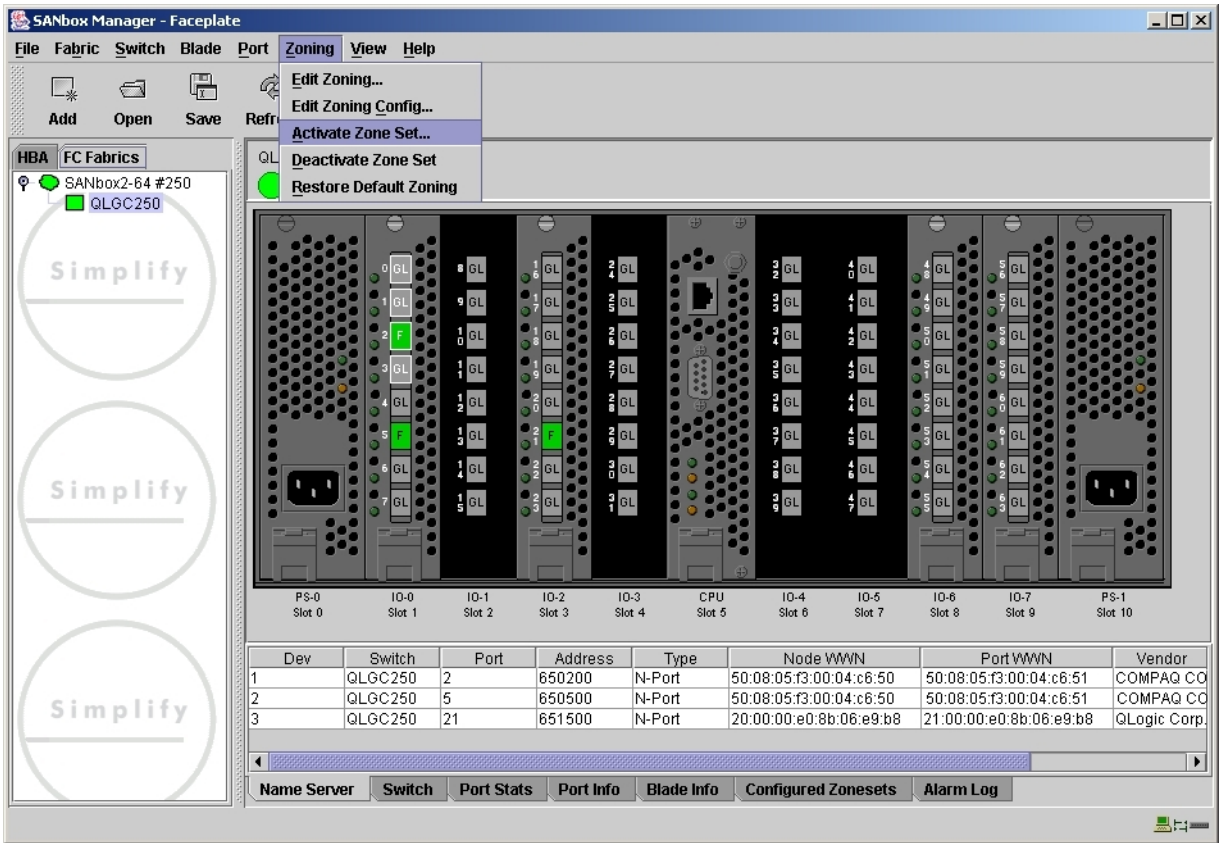


6. Click **OK** to the Zoning Data message:

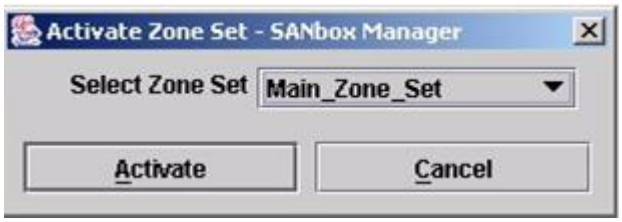
7. Click **OK** to close the Update Zoning Information message:



8. In the SANbox Manager – Faceplate dialog, select **Activate Zone Set…** from the **Zoning** menu:


SANbox Manager - Faceplate
File Fabric Switch Blade Port Zoning View Help
Edit Zoning...
Edit Zoning Config...
Activate Zone Set...
Deactivate Zone Set
Restore Default Zoning
Add Open Save
HBA FC Fabrics
SANbox2-64 #250
QLGC250
Simplify
PS-0 Slot 0
IO-0 Slot 1
IO-1 Slot 2
IO-2 Slot 3
IO-3 Slot 4
CPU Slot 5
IO-4 Slot 6
IO-5 Slot 7
IO-6 Slot 8
IO-7 Slot 9
PS-1 Slot 10
Dev Switch Port Address Type Node WWN Port WWN Vendor
1 QLGC250 2 650200 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
2 QLGC250 5 650500 N-Port 50:08:05:f3:00:04:c6:50 50:08:05:f3:00:04:c6:51 COMPAQ CO
3 QLGC250 21 651500 N-Port 20:00:00:e0:8b:06:e9:b8 21:00:00:e0:8b:06:e9:b8 QLogic Corp.
Name Server Switch Port Stats Port Info Blade Info Configured Zonesets Alarm Log

9. From the Activate Zone Set dialog, select the zone set you wish to use and click **Activate**:



10. Click **OK** to the Activate Zone Set message:

Storage Configuration

This section outlines configuration procedures for the HP StorageWorks Modular SAN Array 1000 (MSA1000).

HP StorageWorks MSA1000 Overview

The HP StorageWorks MSA1000 is a Fibre Channel storage array system for entry-level and midrange SANs that comes with a single high-performance controller, an optional controller, and optional drive enclosures.

QLogic has tested the configurations described in this guide for the MSA1000. For more information about the HP storage solutions, refer to the HP website at the following addresses:

HP StorageWorks Program

http://h18006.www1.hp.com/storage/index.html

MSA1000 Overview

http://h18006.www1.hp.com/products/storageworks/msa1000/index.html

MSA1000 Documentation

http://h18006.www1.hp.com/products/storageworks/msa1000/documentation.html

MSA1000 Configuration

The following sections describe how to configure the MSA1000.

- Assumptions
- Configuration Steps

Assumptions

The following procedures assume that:

- You have allocated storage space of suitable size for the application being used.
- You have installed an MSA1000 controller in slot 1 (front right of the MSA1000).
- Your storage system has an available port.

Configuration Steps

The following procedures prepare your MSA1000 with two RAID Arrays and two LUNs using the CLI. Completing these steps will prepare the allocated storage for connection to the fabric:

- Setting up the Serial Connection
- Creating a RAID and LUN
- Identifying the Unit
- Adding and Identifying Connections
- Adding the Access Control List
- Verifying Device Detection

Setting up the Serial Connection

1. Using a serial cable with the appropriate adapters, connect the MSA1000 device to the host computer.
   - MSA1000 adapter = RJ45Z
   - Host computer adapter = serial port
2. Open HyperTerminal and configure the host computer's COM port with the following settings:
   - Bits Per Second = 19200
   - Data Bits = 8
   - Stop Bits = 1
   - Flow Control = None

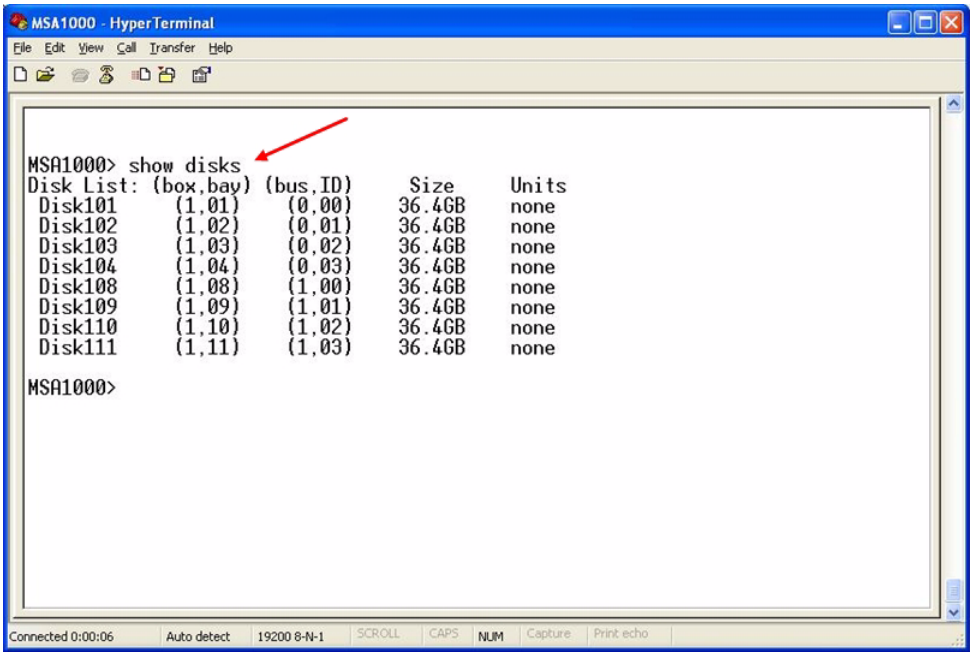
   The device is now ready to configure using the command line interface.

Creating a RAID and LUN

1. Type the following command to view the current disk configuration:

   ```
   show disks
   ```

2. For each disk, note the following information (each disk is identified by box number and bay number; in the following example, Disk111 is located in box 1, bay 11):
   - **Name** of disk from **Disk List**
   - **box** number
   - **bay** number
   - **bus** number
   - **ID** number
   - **size**

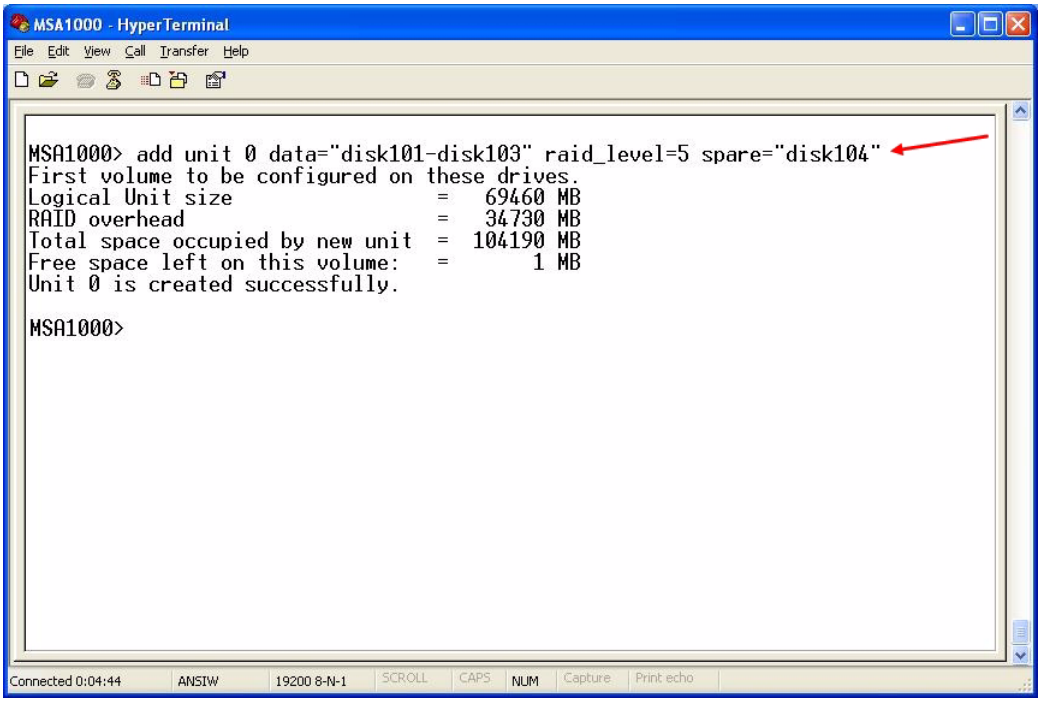


3. Verify that disks are not assigned to any Units.
4. Configure the units using the add unit command as illustrated below.

   NOTE: To create multiple LUNs in a single Unit see the MSA1000 documentation on using the optional size command.

For example, the following command adds disk101, disk102, and disk103 to Unit 0, sets the unit RAID level to 5, and sets the redundant or spare disk to disk104 (the quotes are a necessary part of the command):

```
add unit 0 data="disk101-disk103" raid_level=5 spare="disk104"
```


MSA1000 - HyperTerminal
File Edit View Call Transfer Help
MSA1000> add unit 0 data="disk101-disk103" raid_level=5 spare="disk104"
First volume to be configured on these drives.
Logical Unit size = 69460 MB
RAID overhead = 34730 MB
Total space occupied by new unit = 104190 MB
Free space left on this volume: = 1 MB
Unit 0 is created successfully.
MSA1000>
Connected 0:04:44 ANSIW 19200 8-N-1 SCROLL CAPS NUM Capture Print echo

5. Make sure the command output provides a successful completion message, for example: “Unit 0 is created successfully.”
6. To create additional units, repeat steps 4 and 5, using the next available LUN. For example:

   ```
   add unit 1 data="disk108-disk110" raid_level=5 spare="disk111"
   ```

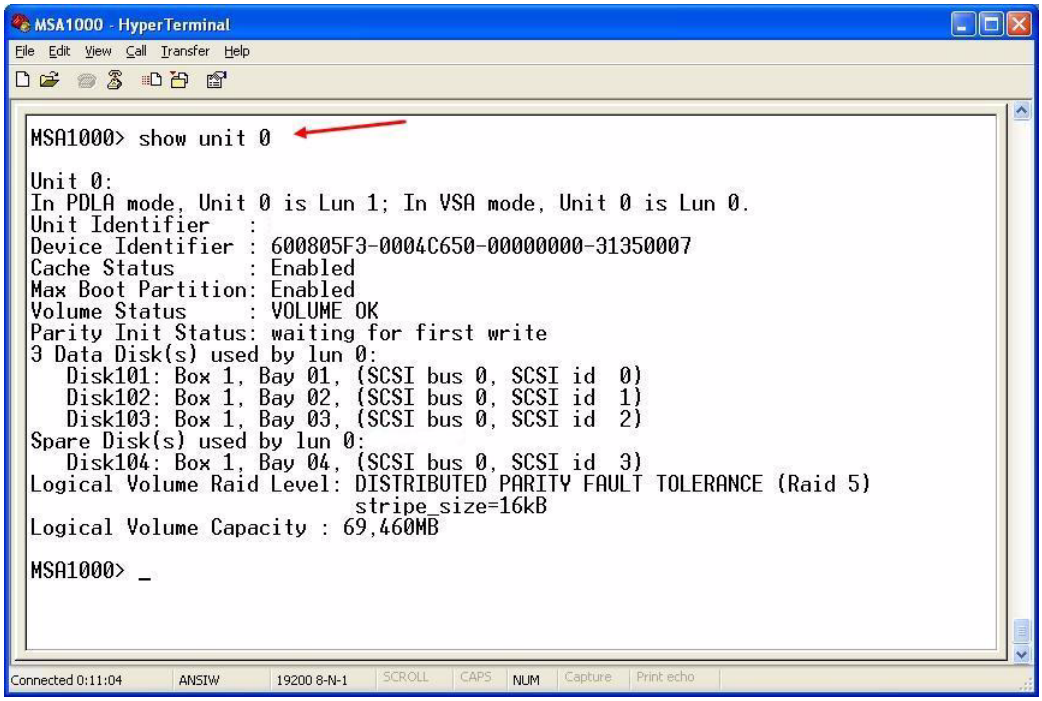
   To view available disks, repeat step 3.

7. Verify that each unit is configured correctly. To view a specific unit, use:

   show unit 0

   Or, to show all units, use:

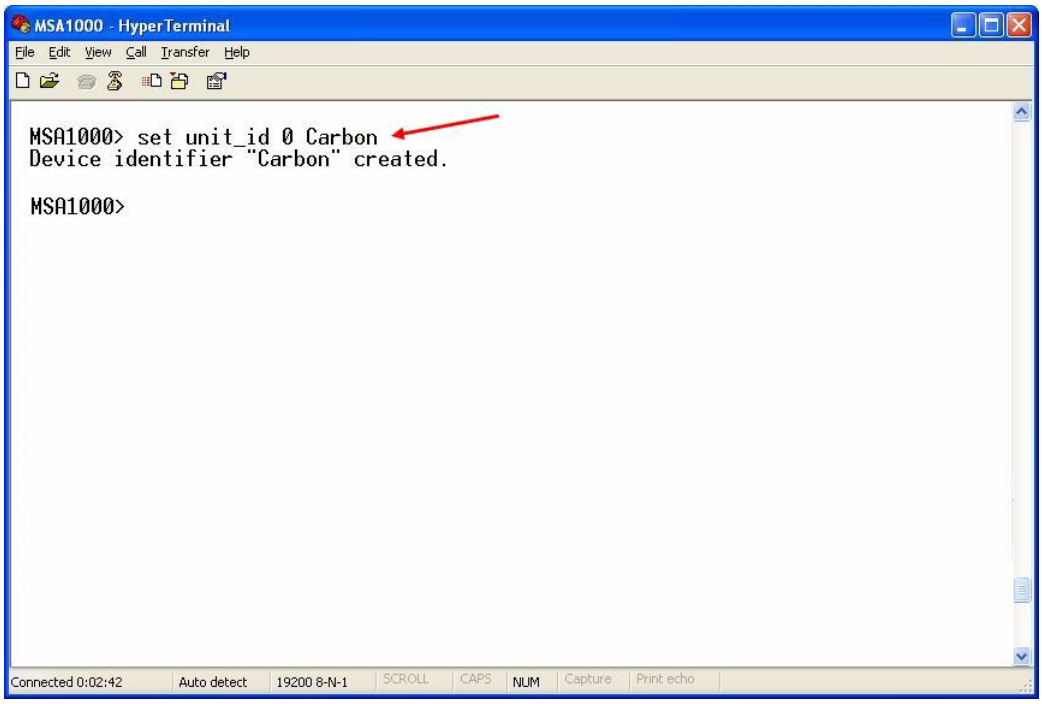
   show units


MSA1000 - HyperTerminal
File Edit View Call Transfer Help
MSA1000> show unit 0
Unit 0:
In PDLA mode, Unit 0 is Lun 1; In VSA mode, Unit 0 is Lun 0.
Unit Identifier :
Device Identifier : 600805F3-0004C650-00000000-31350007
Cache Status : Enabled
Max Boot Partition: Enabled
Volume Status : VOLUME OK
Parity Init Status: waiting for first write
3 Data Disk(s) used by lun 0:
Disk101: Box 1, Bay 01, (SCSI bus 0, SCSI id 0)
Disk102: Box 1, Bay 02, (SCSI bus 0, SCSI id 1)
Disk103: Box 1, Bay 03, (SCSI bus 0, SCSI id 2)
Spare Disk(s) used by lun 0:
Disk104: Box 1, Bay 04, (SCSI bus 0, SCSI id 3)
Logical Volume Raid Level: DISTRIBUTED PARITY FAULT TOLERANCE (Raid 5)
stripe_size=16kB
Logical Volume Capacity : 69,460MB
MSA1000> _
Connected 0:11:04 ANSIW 19200 8-N-1 SCROLL CAPS NUM Capture Print echo

Identifying the Unit

1. Assign a name to the Unit using the set unit_id command. For example, the following command assigns the name, “Carbon”, to Unit 0:

   ```
   set unit_id 0 Carbon
   ```

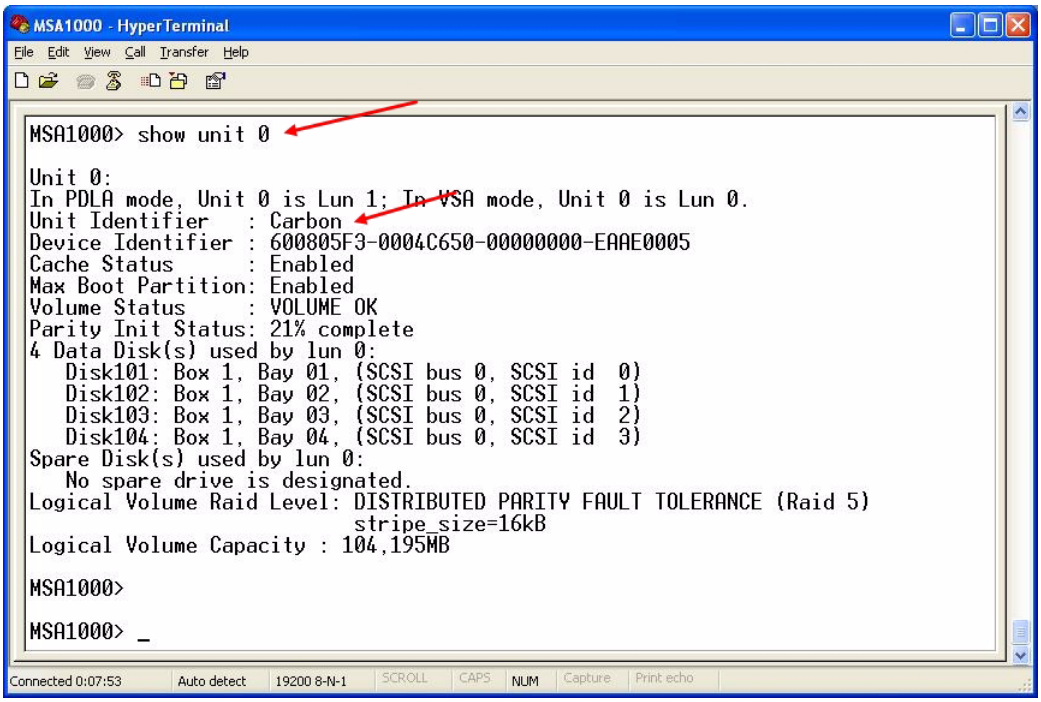


2. Verify that the name has been successfully added using the following command:

   show unit 0

   Or, to verify the name assignment for multiple units:

   show units

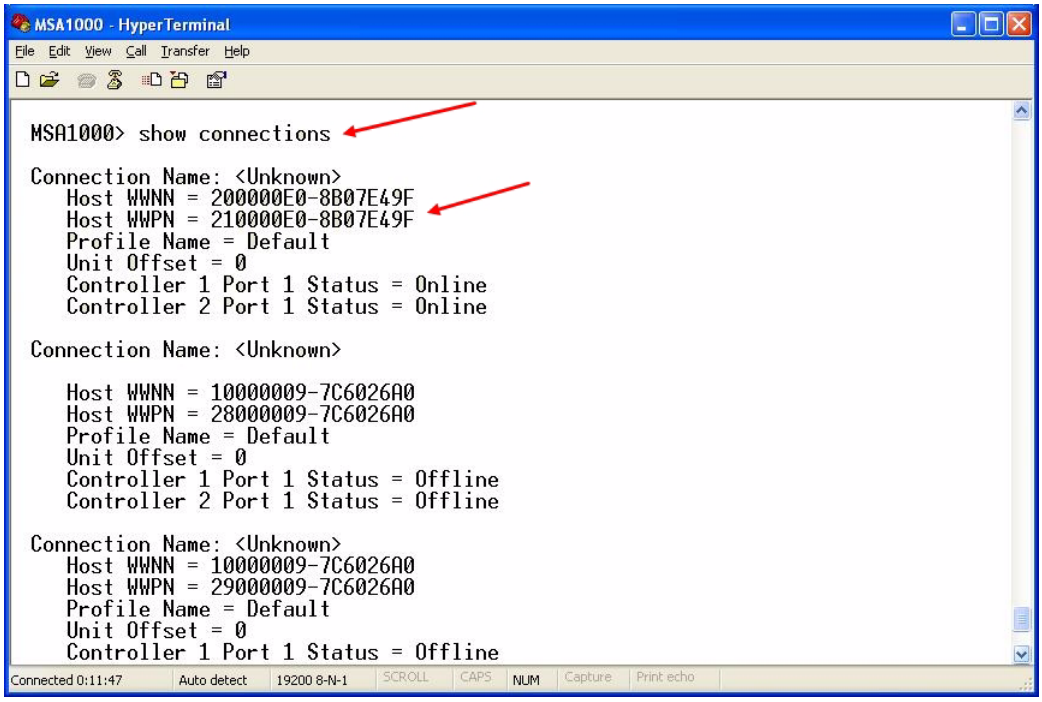

MSA1000 - HyperTerminal
File Edit View Call Transfer Help
MSA1000> show unit 0
Unit 0:
In PDLA mode, Unit 0 is Lun 1; In VSA mode, Unit 0 is Lun 0.
Unit Identifier : Carbon
Device Identifier : 600805F3-0004C650-00000000-EAAE0005
Cache Status : Enabled
Max Boot Partition: Enabled
Volume Status : VOLUME OK
Parity Init Status: 21% complete
4 Data Disk(s) used by lun 0:
Disk101: Box 1, Bay 01, (SCSI bus 0, SCSI id 0)
Disk102: Box 1, Bay 02, (SCSI bus 0, SCSI id 1)
Disk103: Box 1, Bay 03, (SCSI bus 0, SCSI id 2)
Disk104: Box 1, Bay 04, (SCSI bus 0, SCSI id 3)
Spare Disk(s) used by lun 0:
No spare drive is designated.
Logical Volume Raid Level: DISTRIBUTED PARITY FAULT TOLERANCE (Raid 5)
stripe_size=16kB
Logical Volume Capacity : 104,195MB
MSA1000>
MSA1000> _
Connected 0:07:53
Auto detect
19200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

Adding and Identifying Connections

1. List all the HBAs connected to the MSA1000 with the following command:

   `show connections`

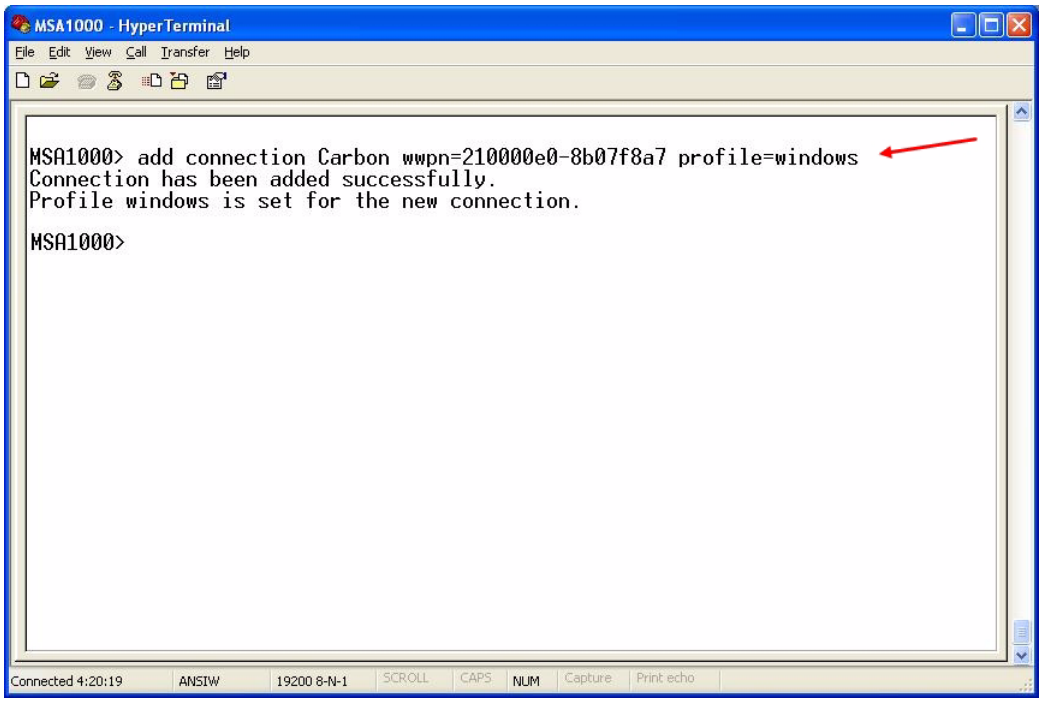
   Verify that your HBA is identified as a connected device and note the Worldwide Node Name (WWNN) or Worldwide Port Name (WWPN) of each initiator so you can name your connections:



2. Type the following add connection command to name your connection, substituting values from your environment. In this example, “Carbon” is the named connection and “windows” is the profile:

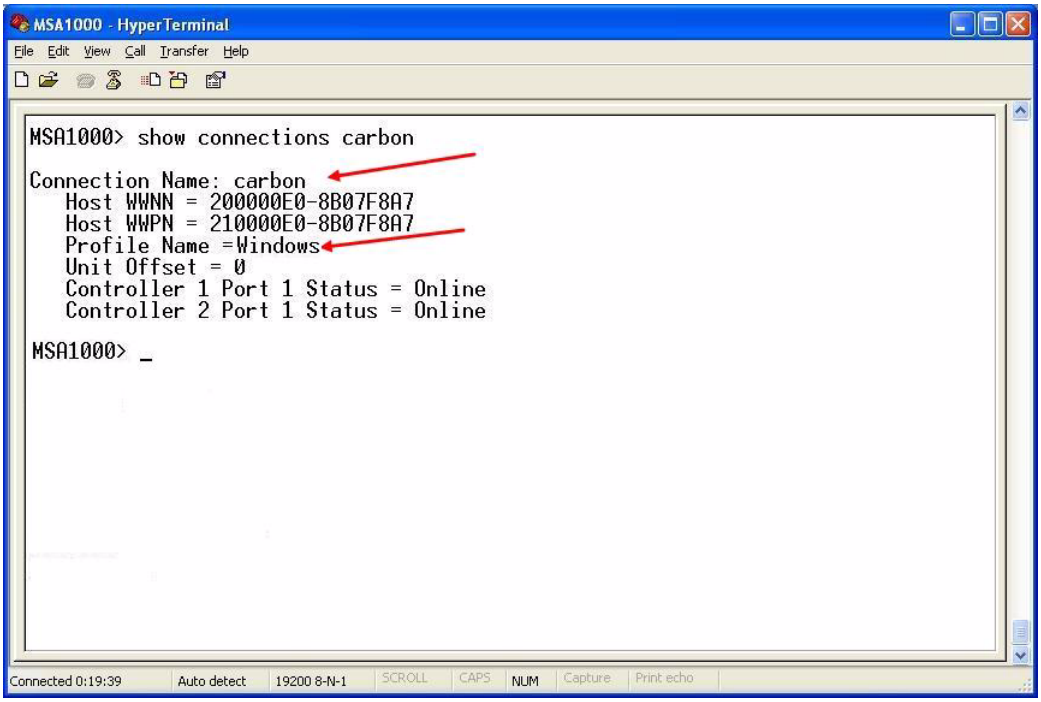
   `add connection` `Carbon wwpn=210000e0-8b07f8a7 profile=windows`

NOTE: Profiles available with the add connection command are Windows, OVMS, Tru64, Linux, Solaris, Netware, and HP. For other options, please refer to the MSA1000 setup documentation.



3. Verify that the name has been successfully added using the following command, substituting the name you assigned for “Carbon”:

   show connections Carbon



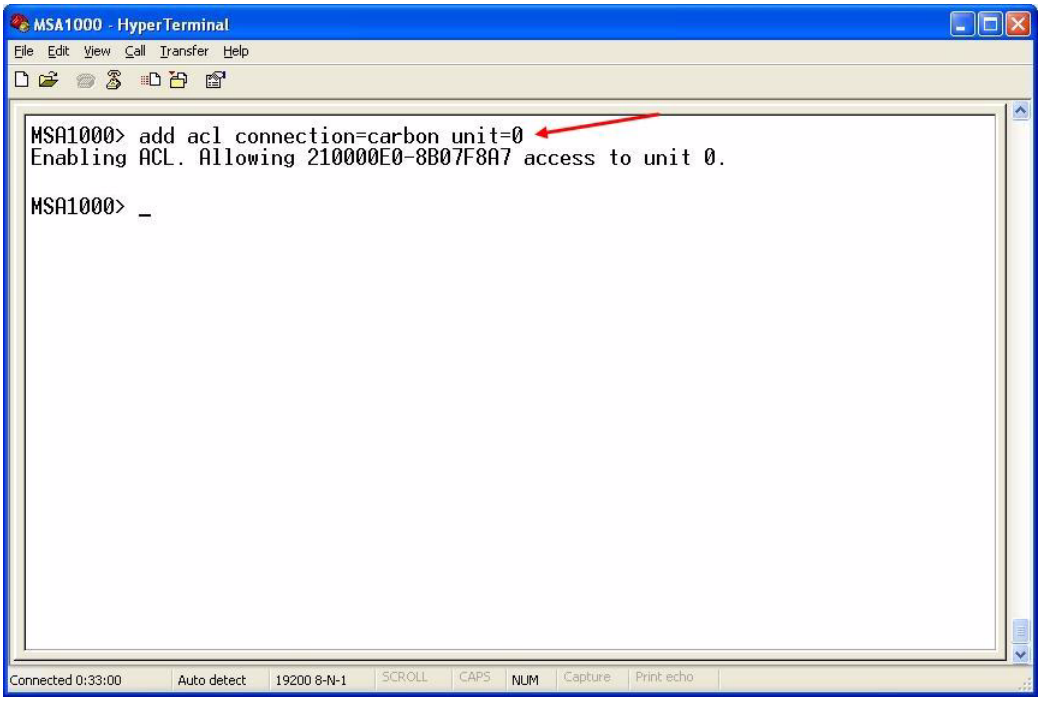
Adding the Access Control List

By default, the ACL is disabled, so all connected devices are allowed access to all configured LUNs. Rather than using a command to activate the ACL, you simply create an entry in the ACL. Immediately after the first entry is added, access to storage is limited to the servers and LUNs listed in the ACL.

To add entries to the ACL:

1. Type the following command, replacing the connection and unit values with values from your environment:

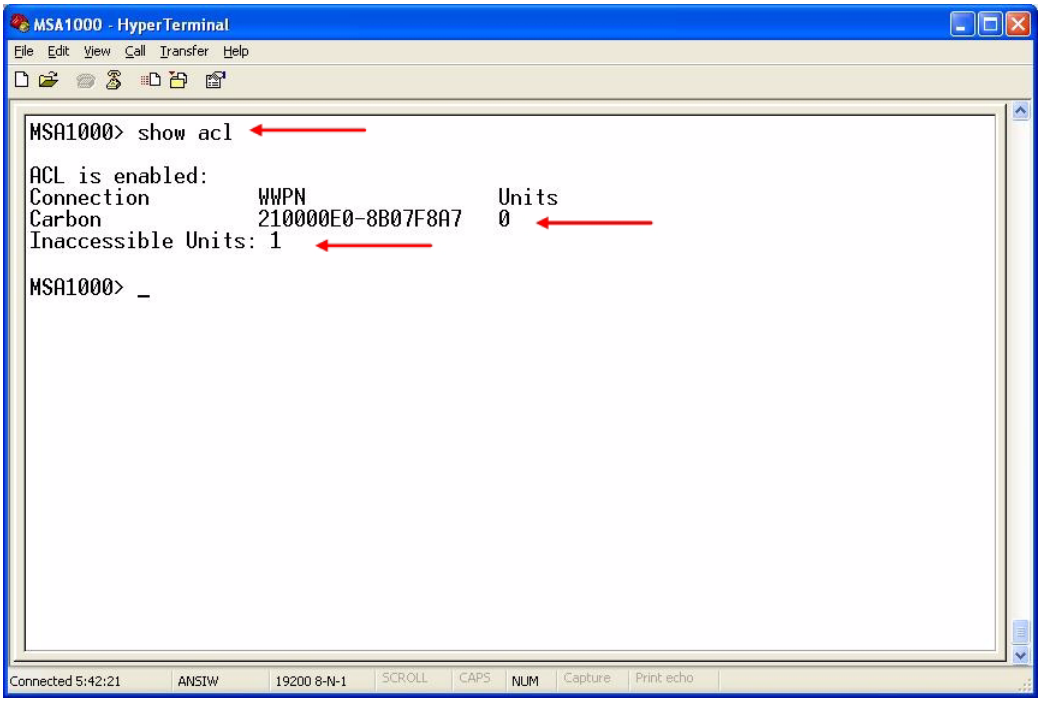
   add acl connection=carbon unit=0



2. Verify that the ACL is configured correctly using the following command name has been successfully added using the following command, substituting the name you assigned for “Carbon”:

   show acl

This command shows whether the ACL exists, which connections are it contains, and whether any configured units are inaccessible.


MSA1000 - HyperTerminal
File Edit View Call Transfer Help
MSA1000> show acl
ACL is enabled:
Connection WWPN Units
Carbon 210000E0-8B07F8A7 0
Inaccessible Units: 1
MSA1000> _
Connected 5:42:21 ANSIW 19200 8-N-1 SCROLL CAPS NUM Capture Print echo

Verifying Device Detection

From each Windows 2000 host, enter the disk management console to verify that the LUNs configured for the host are present.

Testing Your SAN

After completing the storage configuration, the last step is to validate that your storage area network is set up and configured correctly. The following steps will provide you with a very basic test that ensures your storage is accessible by the host and data can be passed across the SAN.

You can use these tests for both the SANbox2 and SANbox 5000 Series switches:

- Zone Verification
- Test Configuration

Zone Verification

To verify zones in **Windows 2000 Server**:

1. Launch the Windows **Microsoft Management Console (MMC)** and click the **Device Manager** icon.
2. Verify that Disk Drives, Medium Changers, Tape Drive, and any other device zone with the host is present in the device tree.

   NOTE: Components may appear under the **Unknown Devices** tree until you install the proper driver.

Test Configuration

To test configuration with **Windows 2000 Server** (Disk):

1. Launch the Windows **MMC** and click the **Disk Management** icon.
2. Verify that the correct number of LUN(s) is present.
3. Write signatures, partition and format the LUN(s) to meet your needs.
4. Copy data to the newly created partition and verify the data transferred correctly by using the DOS **Compare** command or a data comparison application of your choice.

Application Software Configuration

Prior to installing any application software, be sure that:

- Test systems are ready.
- Operating system software is configured and can see all devices.
- Fibre Channel HBAs, tape library, and all the needed SAN infrastructure are available.
- Servers can ping one another on the LAN.

VERITAS NetBackup

VERITAS NetBackup is a commonly used SAN backup and recovery tool tested by QLogic.

Please contact VERITAS for the best way to configure NetBackup. The following links may help you with this process:

VERITAS NetBackup DataCenter

http://www.veritas.com/products/category/ProductDetail.jhtml?productId=nbux

VERITAS NetBackup BusinessServer

http://www.veritas.com/products/category/ProductDetail.jhtml?productId=nbbs

VERITAS Technical Support

http://support.veritas.com/

Index

A

Application device
    tested interoperability 13
Application software
    configuration 97

B

Brocade 3800
    tested configuration 16

C

Cables
    connecting to SANbox 5200 60
    connecting to SANbox2 75
Cascade configurations 15, 16
CLI
    SANbox2 69
Configuration
    application software 97
    cascade 15, 16
    minimum storage requirements 84
    MSA1000 84
    network 35
    SAN overview 19
    SANbox 5000 Series 36
    server overview 20
    tested versions 14

D

Domain ID
    SANbox 5200 48
Driver levels 17

F

Fibre Channel HBAs
    overview 20
Fibre Channel switches
    overview 35
Firmware levels 17

G

Guide
    getting updates 9

H

HBAs
    configuration assumptions 20
    installing drivers 20
    installing pseudo LUN driver 23
    overview 20
    persistent binding 74
HP
    storage overview 83

I

Installation
    HBA drivers 20
    HBA pseudo LUN driver 23
    SANbox Manager for SANbox 5200 37
    SANsurfer Management Suite 25
Interoperability
    device and application 13
Introduction
    QLogic resources 9

IP address
SANbox 5200 45
SANbox2 69

M

McDATA 4500
tested configuration 16
MSA1000
configuration 84

N

NetBackup
configuration 97
Network configuration
overview 35

P

Persistent binding
HBA configuration 74
Port properties
SANbox 5200 56
SANbox2 70

Q

QLA23xx
tested with HP storage 20
QLogic
about 105
company information 105
contacting 106
SANtrack Service and Support Program 11

S

SAN
configuration overview 19
testing 95
SANblade
installing SANblade Manager 25
overview 20
SANbox 5000 Series
configuration overview 36
SANbox 5200
assigning IP address 45
cable connections 60
cascade configuration 15
configuration options 42
domain ID configuration 48
port properties 56
zone configuration 61
SANbox Manager
installing for SANbox 5200 37
SANbox2
assigning IP address 69
cable connections 75
cascade configuration 15
configuration overview 36, 69
installing SANbox Manager 25
port properties 70
serial port configuration 69
zone configuration 76
SANsurfer Management Suite
overview 25
SANtrack Service and Support Program 11
Serial port configuration
SANbox2 69
Server
assumptions for configuration 20
configuration overview 20
tested interoperability 13
Storage
assumptions for minimum requirements 84
tested interoperability 13

Switches
SANbox2 overview 35

T

Testing
overview and interoperability 13
SAN configuration 95
Testing your SAN 95

V

VERITAS
NetBackup 97
Version information
drivers and firmware 17

W

Windows 2000
installing HBA drivers 21
test configuration 95
zone verification 95

Z

Zone configuration
SANbox 5200 61
SANbox2 76
Zone verification 95

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To learn more about QLogic, visit the QLogic website at www.qlogic.com or refer to the contact information on the following page.

Contacting QLogic

For more information about QLogic markets and applications, sales channels, products, milestones and technology roadmaps, please visit the QLogic website at www.qlogic.com or use one of the following contact numbers.

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SAN Configuration Guide HP Storage v2 01 | 04

Over 50 million QLogic products have shipped inside servers, workstations, RAID subsystems, tape libraries, disk and tape drives. Powering solutions from leading companies like Cisco, Dell, EMC, Fujitsu, Hitachi, HP, IBM, Network Appliance, Quantum, StorageTek and Sun Microsystems, QLogic's broad line of controller chips, host bus adapters, network switches and management software move data from storage devices through the network fabric to servers. QLogic was recently named to Business Week's list of 100 Hot Growth Companies for 2003.

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Business 2.0 100 Fastest Growing Tech Companies
BusinessWeek Global 1000
***BusinessWeek* Hot Growth Company**
***Forbes* Best 200 Small Companies**
***Fortune's* 100 Fastest Growing Companies**
Network Computing
- **Editor's Choice**
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